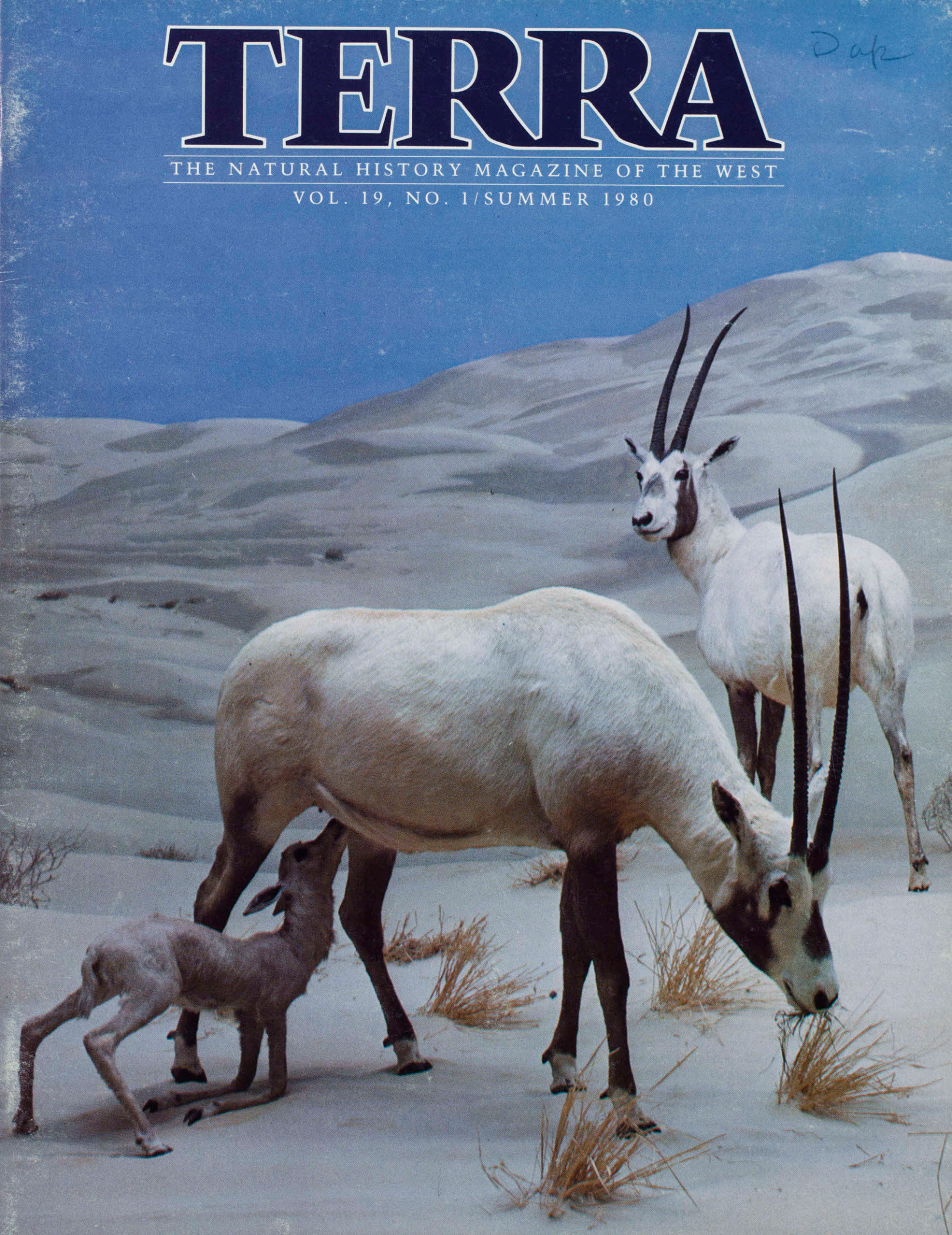
TERRA

THE NATURAL HISTORY MAGAZINE OF THE WEST
VOL. 19, NO. 1/SUMMER 1980



Museum On The Move

For some time now our Museum has been gaining momentum in its movement towards becoming the major influence in natural history in the western United States. Today the Los Angeles Museum can look back with pride over several decades of development in this direction. We are a museum on the move. The impetus for this momentum lies perhaps in the fact that Los Angeles itself is becoming the center for scientific and cultural development in the United States. Los Angeles is the center of the entertainment and information industry, as well as scientific and research activities in all disciplines. Southern California is a wonderland of natural history which includes the vast expanse of the southwestern deserts, the wonderful majesty of the Sierra-Nevada and the awesome beauty and force of the Pacific Coast. In these last two decades of the twentieth century the Natural History Museum of Los Angeles County will become the focal point of all natural history and history activities in this part of the world. We should aspire to extending the privileges of membership and participation to many times the numbers of people we now serve. Hardly a day goes by that I do not hear from some Alliance members who express their pleasure in being a part of this great Museum. My hope is that many more will be able to take advantage of this grand opportunity for education and exploration which Alliance membership provides. 1980–81 will see several important exhibitions presented at the Museum as well as many exciting field trips and explorations. The advantages are many, the rewards are great and the horizons are limitless for active participation in the Museum and its programs.

William B. Lee, Director

Curators & Collections

Darwin Exhibit

A temporary exhibit on Charles Darwin and the voyage of HMS *Beagle* opens September 15th in the Hall of Evolving Life. When he was twenty-two years old and without extensive academic training, Darwin was to serve as naturalist during the five-year cruise (1831–1836) devoted to mapping and navigational calculations. Circumnavigating the globe, the *Beagle* took Darwin to every major continent in the southern hemisphere, excluding Antarctica. Featured in the exhibit are specimens from our collections similar to those that Darwin examined and collected during extensive trips ashore — fossilized bones of extinct sloths and other mammals from Patagonia (Argentina), fossil invertebrate shells from the Andes Mountains, flightless birds and other strange vertebrates from the Galapagos Islands. Viewers will get to share some of the experiences and objects which impressed and molded Darwin's thinking and which eventually led Darwin to write one of the most important books ever published. The cruise of the *Beagle* was the experience that focused his interest and gave direction to the rest of his life.

Flightless cormorant of the Galapagos Islands (Nannopterum harrisi)

Museum Hosts Beijing Scientists

A significant step in the reestablishment of communication between scientists in the United States and the People's Republic of China was taken in June with the visit to Los Angeles of a delegation from the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) of the Academia Sinica, Beijing, China.

The Natural History Museum of Los Angeles County is one of several institutions visited by the Chinese scientists on a month-long tour of the United States sponsored by the L.S.B. Leakey and Wenner-Gren Foundations.

The IVPP has a long and distinguished history of study in paleontology and paleoanthropology dating back to the last century, but very little has been heard from them in the last twenty years. In this first visit since the Great Cultural Revolution, the Chinese are represented by leading scientists in their fields including Dr. Minzhen Chow, (Continued on Page 30)

TERRA

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New Arabian Oryx habitat diorama sponsored by Maurice Machris at the Natural History Museum of Los Angeles County —Exotic Mammal Hall, Second Floor. Photo: Larry Reynolds

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MUSEUM-ZOO RELATIONS AND THE ARABIAN ORYX

by JAMES D. OLSON and DONALD R. PATTEN

Maurice A. Machris, Exhibit Sponsor (right), discusses scale model prior to exhibit development with Fred S. Truxal, Chief Life Sciences Division and James D. Olson, author

THE days of grandiose museum field expeditions to exotic places, expressly for hunting purposes, have long vanished. Historically, museum taxidermists and big-game hunters secured the large mammals used in museum exhibits. This has changed significantly in recent years as more and more populations of large mammals have declined drastically and their natural habitats have been altered or destroyed. To achieve scientifically accurate habitat dioramas, field expeditions are still necessary in order to study and photograph pristine environments and to secure samples of vegetation.

Currently, a significant number of the mammal specimens used in the exhibits are received from zoos, wild animal parks, as well as state and federal game agencies. The United States Customs and the United States Fish and Wildlife Service occasionally provide the museum with mammal pelts that have been confiscated. In the past, zoo specimens were usually undesirable for use in exhibits. Due to their sedentary existence, the animals were often too fat and their pelts of poor quality, making them unsatisfactory representatives of their counterparts in the wild. Fortunately, this has changed. Due to a better understanding of animals in captivity, improved diets, more comprehensive veterinary care, and better-designed living quarters, most zoo specimens are now of good quality.

By acknowledging the fact that these animals were obtained from a zoo, the museum is given the opportunity to continue the public educational process. In this manner the educational, scientific and aesthetic values are not lost; they are just of a different type. By utilizing valuable zoo specimens in an exhibit, the museum can continue to provide valuable information to both the public and

Maned Wolf diorama—animal from San Diego Zoo. Photo: Larry Reynolds

Opposite: Snow Leopard diorama—animal from San Diego Zoo. Photo: Larry Reynolds

the laboratory scientists.

THE United States is fortunate in having a significant number of prestigious zoological gardens with outstanding examples in Southern California. The San Diego and Los Angeles zoos have been extremely helpful and cooperative with this Museum. In addition to making deceased specimens available to us, their pathologists have given special attention and care to ensure cosmetic necropsies on those specimens to be utilized in our exhibits. In return, we have provided specimens for use in teaching and for study by their veterinarians prior to complicated surgery on living animals. Scientists at the San Diego Zoo have utilized specimens in our mammal collection for their studies on dental pathology in primates.

Because of the cooperation of zoos and various governmental agencies, this Museum, as well as the other large natural history museums in the United States has been able to develop exhibits of rare and endangered species which would otherwise not have been possible. For example, our Museum has recently installed habitat dioramas of the snow leopard and maned wolf. In the immediate planning stages are dioramas of the okapi, great Indian rhinoceros, woolly tapir, koala, jaguar, and Bezoar wild goat.

IN the near future a habitat diorama of California sea otters will be opened. The five otters featured were provided by the California State Department of Fish and Game and Sea World of San Diego. These organizations cooperate in treating and rehabilitating sea otters that become incapacitated in the wild because of illness, predation, accidents, or other causes. Because of their high success rate in rehabilitating and returning injured otters to the wild, it has taken five years to obtain enough otter specimens for use in the exhibit.

Other specimens are needed to complete the long-range plans for our exhibit galleries. Some goals require time and patience, however, such as our need for lowland gorillas. Since gorillas are hardy and long-lived mammals, it will take many years to acquire enough specimens for a complete family group. All United States zoos with large captive gorilla populations have been contacted, and we have been promised cooperation by those zoos not having prior commitments. We have extended our search worldwide in an effort to obtain specimens of the exotic giant panda and white tiger.

FIVE years of planning and development have concerned the Arabian oryx, a rare and beautiful desert antelope. Because it is unique, the story behind this exhibit is worth relating.

In 1950 there were known to be only three main wild populations of *Oryx leucoryx* along the southern and eastern fringe of the great Rub-al-Khali Desert of the Arabian Peninsula. By 1951, all but one of these populations had been extirpated by hunting. Because of its isolation, the easternmost population had survived, and was estimated in 1959 to consist of eighty to 100 animals, in several herds of no more than twenty oryx each. In December and January, 1960–61, this population was raided by a motorized "hunting party" which is believed to have killed forty-eight oryx by running them to exhaustion with vehicles and shooting them.

"Hunters armed with machine guns have shot what is believed to be the world's last surviving herd of Arabian oryx, a large and graceful desert antelope" (New York *Times*, 28 March 1961).

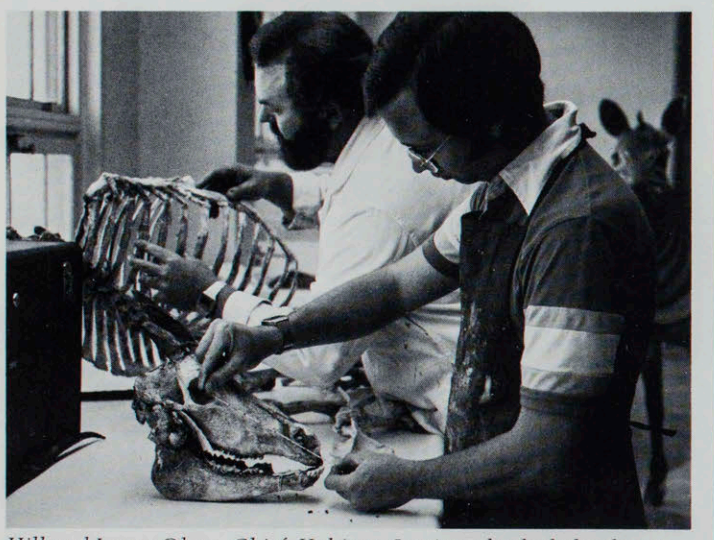
News of this event, which occurred in a remote desert region, stimulated various conservation groups to unite their efforts to save the doomed Arabian oryx (*Oryx leucoryx* Pallas). It also triggered a complex chain of events that ultimately involved this Museum.

UNDER the auspices of "Operation Oryx," the Fauna Preservation Society of London and the International Union for Conservation of Natural Resources jointly sponsored an expedition in April and May, 1962, to locate and capture three live specimens from the remaining wild population in order to establish a captive breeding herd. The cost of the holding period in Kenya and all subsequent expenditures were assumed by the Shikar-Safari Club. Another female oryx was donated by the Zoological Society of London. Mr. Maurice Machris, then President of the Shikar-Safari Club International, was responsible for finding a new home for the wild-captured oryx (see *TERRA*, vol. 15, no. 2, Fall 1976). The captive herd thrived in their original home at the Phoenix Zoo, and in 1972 six oryx were moved to establish a second breeding herd at the San Diego Wild Animal Park. The ultimate goal is to re-establish the Arabian oryx in the wild within a protected and ecologically suitable habitat.

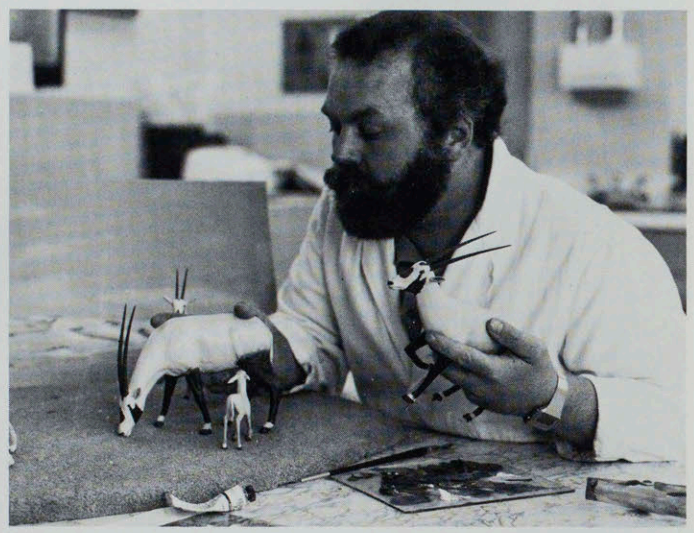
In a survey taken of eighty-one of the world's major museums, it was noted that considering the Arabian oryx has been known to science since 1777, the available material in the world's museums is pitifully little. It is obvious that few specimens have been preserved of this

Steven Hill, Museum modelmaker, records measurements needed by taxidermist, prior to skinning young oryx. Photo: John DeLeon

Hill takes extreme care while removing the delicate skin of the young oryx. The dried skin, which is later tanned, is then sent with the cleaned skeleton to the taxidermist. Photo: John DeLeon

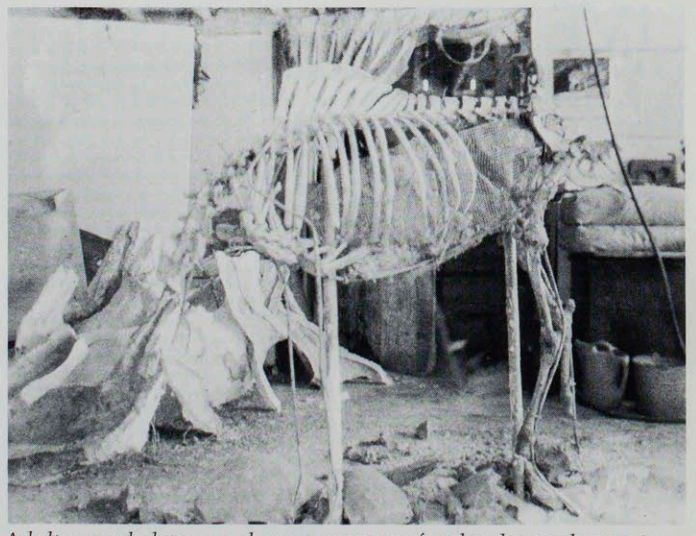


Hill and James Olson, Chief, Habitats Section, check skeletal measurements and reference numbers prior to shipment to taxidermist. Photo: Larry Reynolds



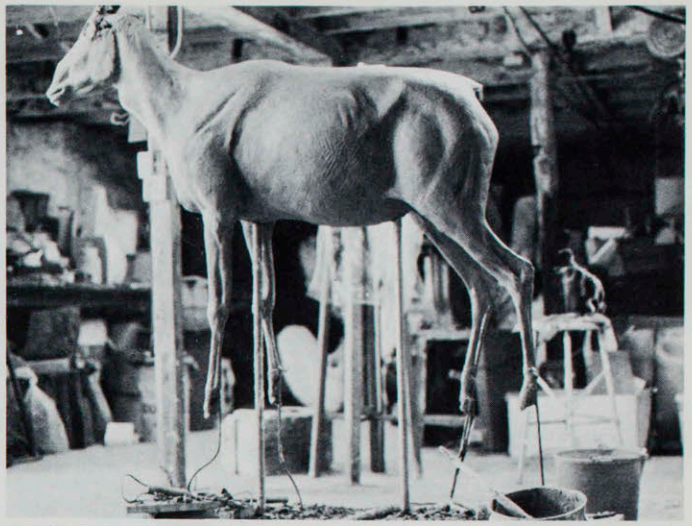
Olson positions finished miniature oryx, modeled to scale, in front of background sketch. This model is used by the taxidermist in developing final animal mounts. Photo: Larry Reynolds

Clark Provins, background artist, refers to sketch while laying in ground colors. The desert background painting was completed in seven weeks. Photo: John DeLeon

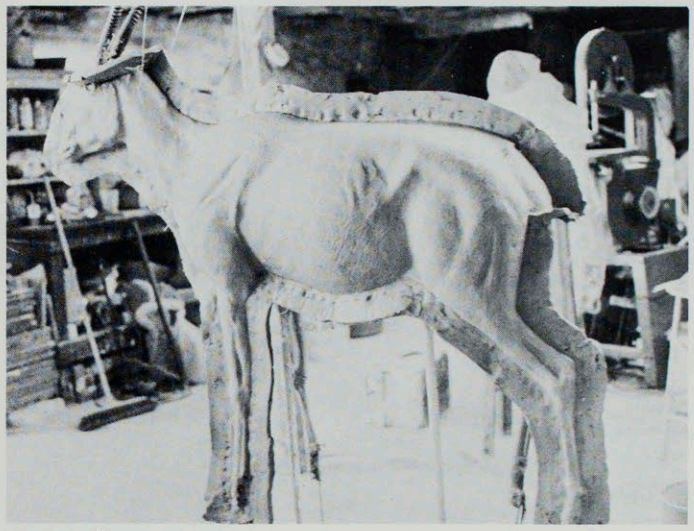


Adult oryx skeleton used as an armature for the clay sculpture, in taxidermist Ernst Gramatzki's studio, Burlington, Wisconsin. Photo: Ernst Gramatzki

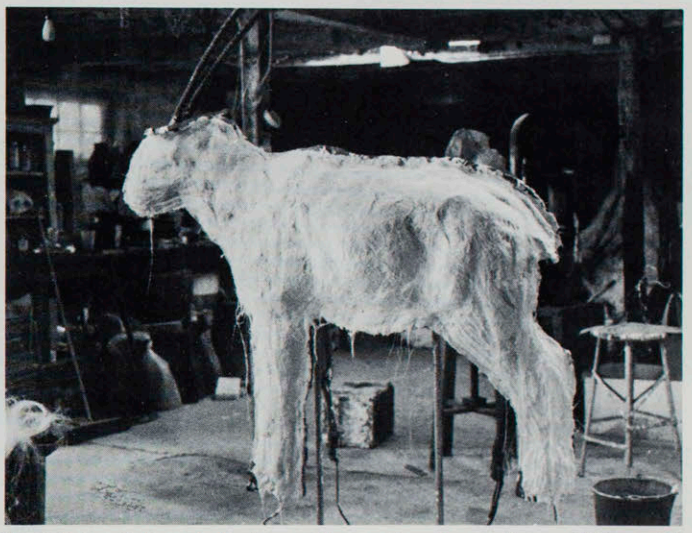
Oryx skeleton covered with clay, beginning of sculpting process. Notice exposed skull and leg bones. Photo: Ernst Gramatzki



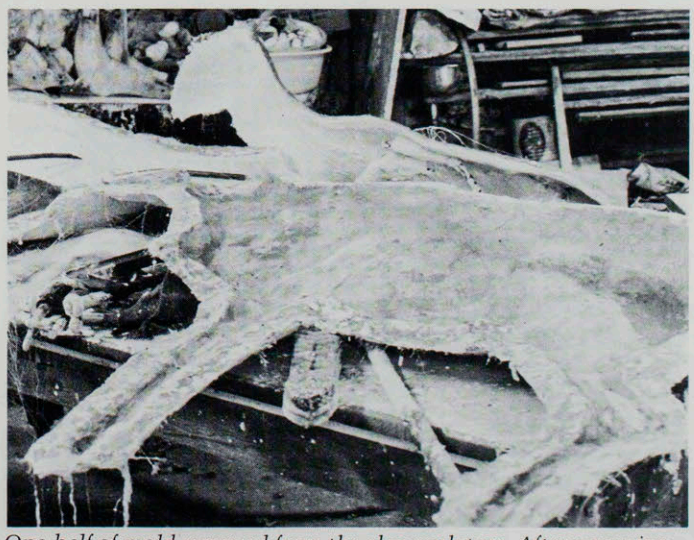
Finished clay sculpture of adult oryx. The sculpture conforms with measurements taken before skinning to ensure that the skin will fit the model. Photo: Ernst Gramatzki



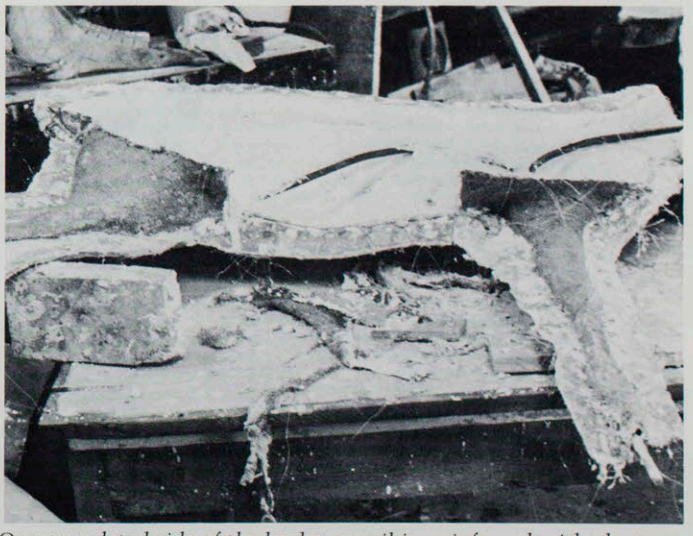
Oryx sculpture with plaster mold on one side. Photo: Ernst Gramatzki



Complete reinforced plaster mold over the clay sculpture. This mold is used to make the lightweight burlap manikin. Photo: Ernst Gramatzki

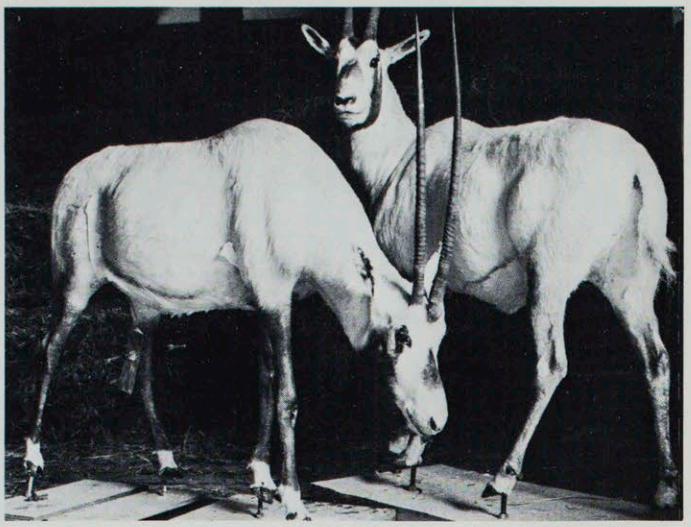


One-half of mold removed from the clay sculpture. After removing the mold the clay is stripped from the skeleton, the skeleton is then cleaned and kept for scientific research. Photo: Ernst Gramatzki



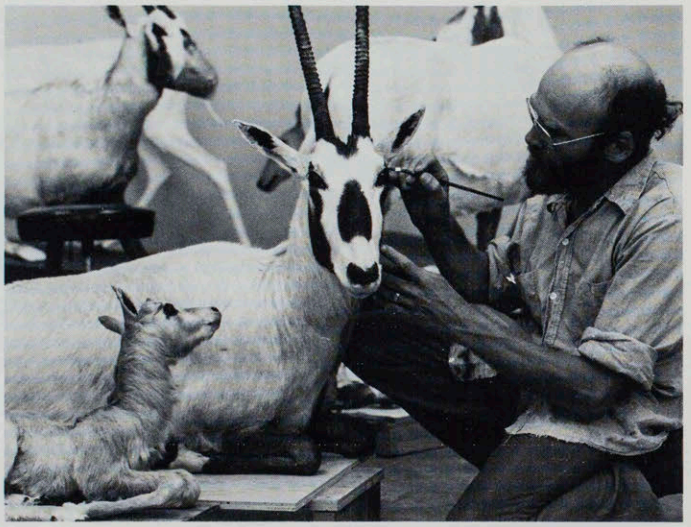
One completed side of the burlap manikin, reinforced with plaster and steel rod. Photo: Ernst Gramatzki

Gramatzki fitting two manikin halves together to form a complete manikin body. The animal skin is glued and sewed to this finished manikin. Photo: Ernst Gramatzki

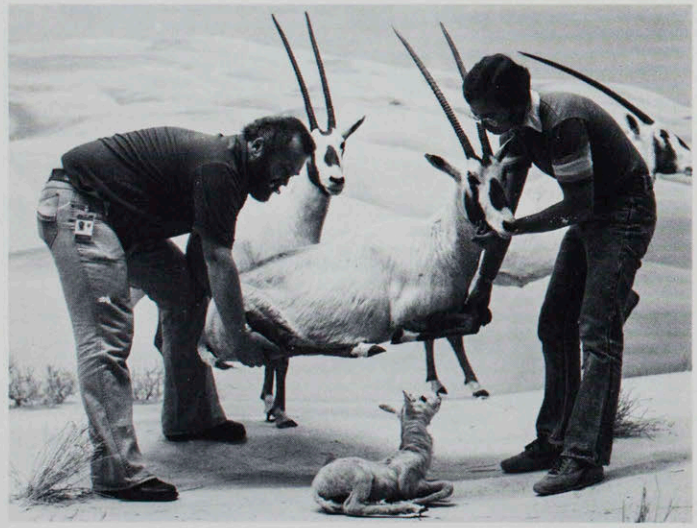


Two adult oryx, drying after the freshly glued skins are tacked and clamped to conform to surface contours of the manikin. Notice reinforcing rods at base of feet. Photo: Ernst Gramatzki

Taxidermist Gramatzki in Museum studio, gluing horns on oryx after a safe journey across country. Photo: Larry Reynolds



Gramatzki completing last-minute touch-ups before returning to his Wisconsin studio. Photo: Larry Reynolds



Olson and Hill installing last female oryx in habitat diorama. Photo: Larry Reynolds

Hill and Olson installing additional foreground grass in diorama. Photo: Larry Reynolds

Two adult Arabian Oryx at San Diego Wild Animal Park. Photo: San Diego Zoological Society

highly endangered mammal. As the survey revealed, of the total known preserved material of the Arabian oryx, only seven full mounts were reported, as were three sets and four single specimens of horns, thirty-one skulls, sixteen complete and one partial skeleton, twenty skins, and one unprepared carcass.

ADDITIONAL efforts by Mr. Machris established this Museum as a repository for those oryx which die while in captivity in the United States. His plan in 1975 was to establish a scientific research collection of Arabian oryx, and to create the first habitat diorama of this species in the world. As Mr. Machris noted, it is particularly important to preserve skeletal and other specimen materials of those species which no longer, or only barely, survive in the wild for comparative studies and evolutionary research. We are at present attempting to obtain the skeletons of specimens of the Arabian oryx in the United States as they die.

Mr. Machris' dream of a habitat diorama featuring the Arabian oryx is about to be realized, thanks to long-range planning and the cooperation of United States zoos. The Natural History Museum of Los Angeles County has just completed a diorama, sponsored by Maurice Machris, which features seven Arabian oryx in a natural habitat. The first specimen suitable for taxidermy was received by the Museum from the Los Angeles Zoo on March 15, 1976, and the last of six specimens from the San Diego Wild Animal Park arrived January 30, 1979.

In February, 1979, a miniature scale model of the diorama was constructed and modeled by Steven L. Hill and James D. Olson of the Museum's Habitat staff. This model served as a guide for museum taxidermist Ernst A. Gramatzki, who had completed all seven oryx by August, 1979. The background painting, a recreation from photographs of the Saudi Arabian Desert taken by Mr. Machris, was completed on August 8, 1979, by Clark M. Provins.

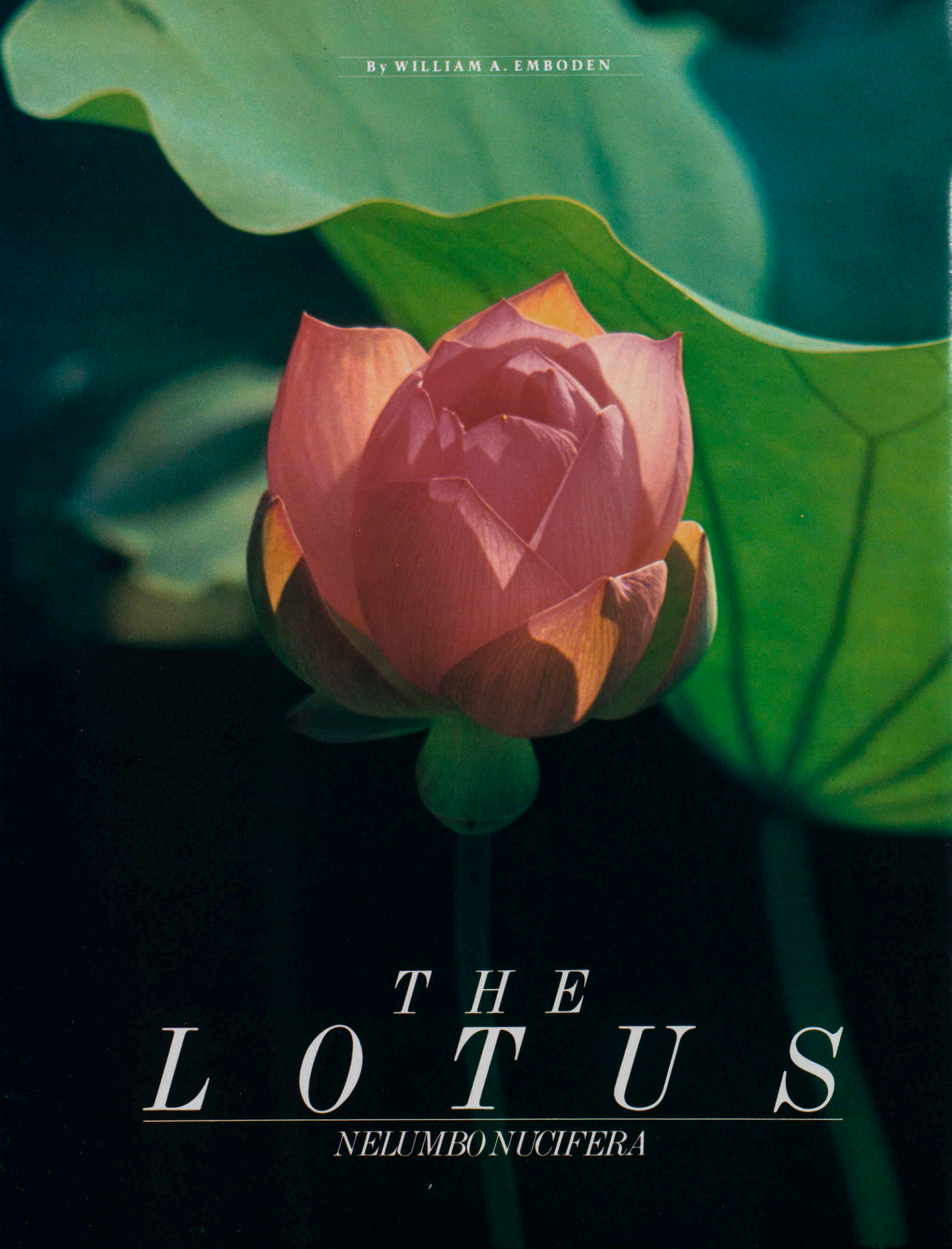
THE skeletons of all seven oryx used in the diorama, as well as those of other oryx unsuitable for taxidermy, have been added to the mammal research collection. Two of the three oryx (one female and two males) originally captured in Yemen in 1962 and flown to the Phoenix Zoo have been received by the Museum. One of these is "Pat," a seventeen-year-old male who sired fourteen offspring (seven males, seven females) during his thirteen years at Phoenix. "Edith" was thought to be two years old at the time of her capture and left thirteen progeny (seven males, six females) during her sixteen years in the Phoenix Zoo. She was usually retiring, but became aggressive when crowded, and was the dominant female in the herd for many years.

THANKS to the combined efforts of many conservation organizations, governments, and dedicated individuals, the Arabian oryx is now prospering in captivity. This cooperative effort may well prove a model for similar projects attempting to save other endangered species.

As this story illustrates, the zoo-museum "marriage" has therefore proven mutually beneficial. We feel that the cooperation between zoos and museums will become even more important as mankind continues to drastically alter the world and as knowledge of the earth's complex ecology improves.

James Olson is Chief of the Habitats Section, Natural History Museum of Los Angeles County, and is responsible for the planning and development of habitat dioramas. Donald Patten is Curator of Mammalogy. Both have worked together for many years procuring specimens needed for exhibition and research.

By WILLIAM A. EMBODEN



THE LOTUS

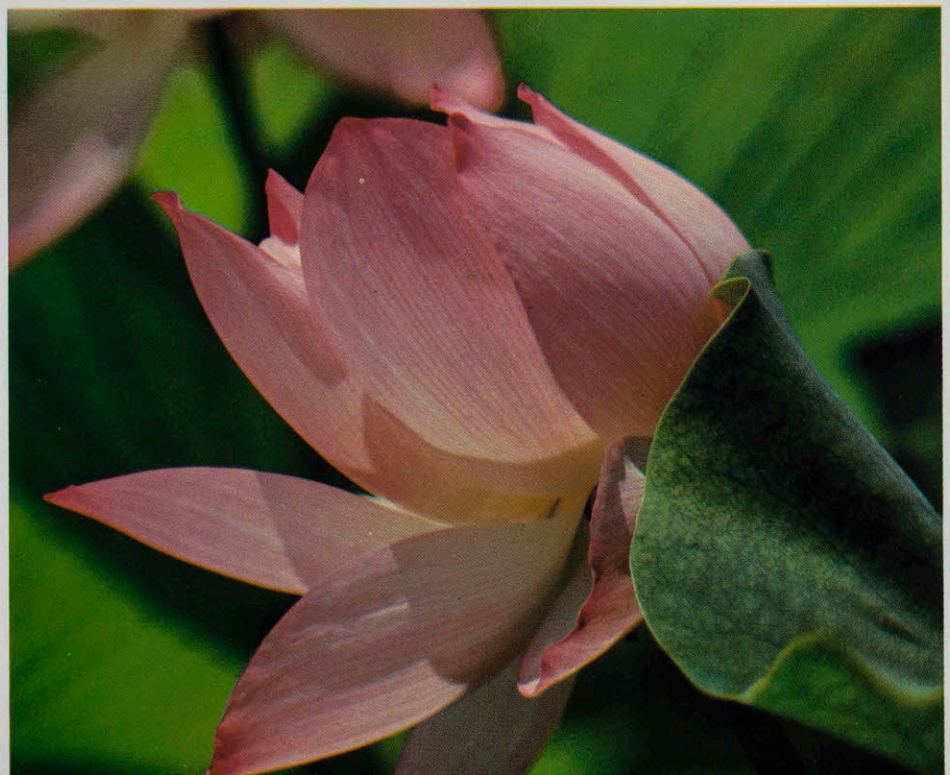
NELUMBO NUCIFERA

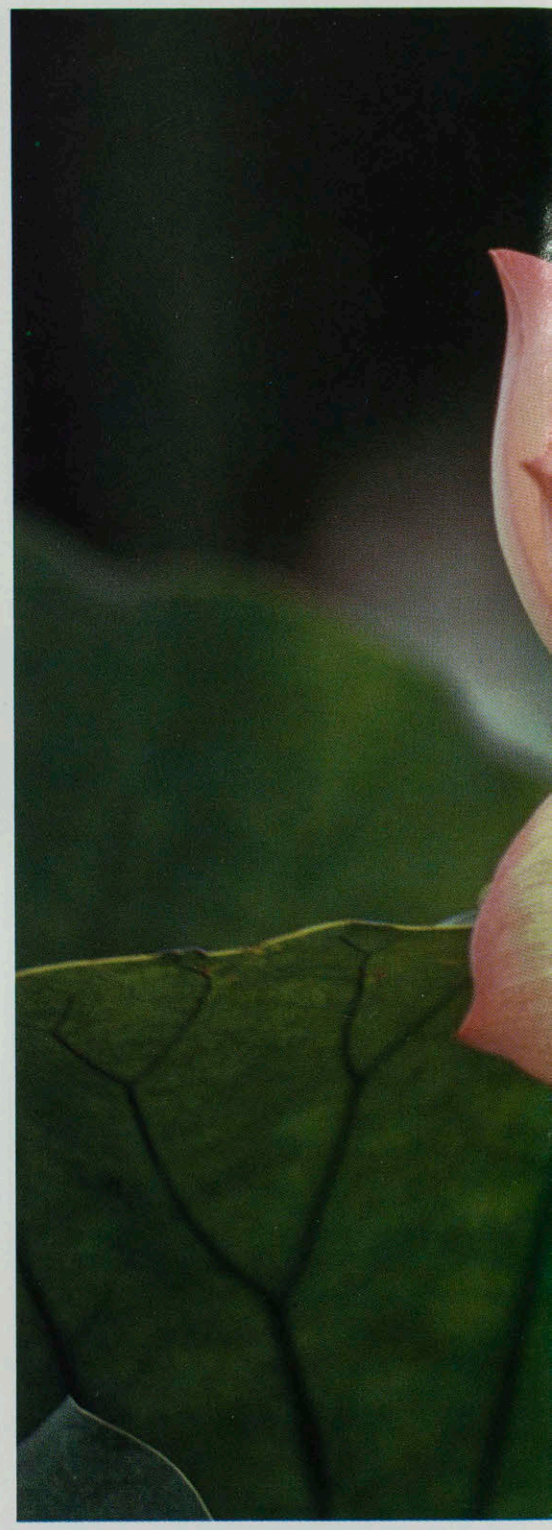
The photographs of the lotus that grace this issue of TERRA are by John D. Nicolais, who died last year at the age of thirty-nine. An accomplished architect, pianist, artist, and teacher, he was also a gifted photographer. Nicolais' photographic work comprises a staggering and valuable collection that covers many countries and cultures. Museums and universities are vying for the collection to set up a permanent archive of his work. His photographic work includes a number of exhibitions, illustrated lectures, articles (in TERRA and *Smithsonian*, among others) and books, including three monographs recently published by *A+U* on the architecture of Louis I. Kahn, Charles W. Moore, and Philip Johnson.

Nicolais' acute sense of detail and the strength of his images seemed to pervade any subject that caught his eye, including the lotus celebrated here. Growing in a small section of the lake in the Silverlake area's Echo Park, these lotuses were recorded over a period of several years, at various seasons and times of day. The photographs are a unique record, in fact an essay on the life cycle of this intriguing plant. TERRA is grateful to the Nicolais family for making these photographs available to us.

"And now
While the round moon withdraws his looming disc
Beneath the western sky, the full-blown flower
Of the night-loving lotus sheds her petals
In sorrow for his loss, bequeathing naught
But the sweet memory of her loveliness
To my bereaved sight."

Sakoontala, Kâdidâsa
(translated from the original Sanskrit by Williams, 1856)





As the rose has inspired the western mind to some of the loftiest of poetic sentiments, so has the lotus enriched Sanskrit literature with exquisite verses.

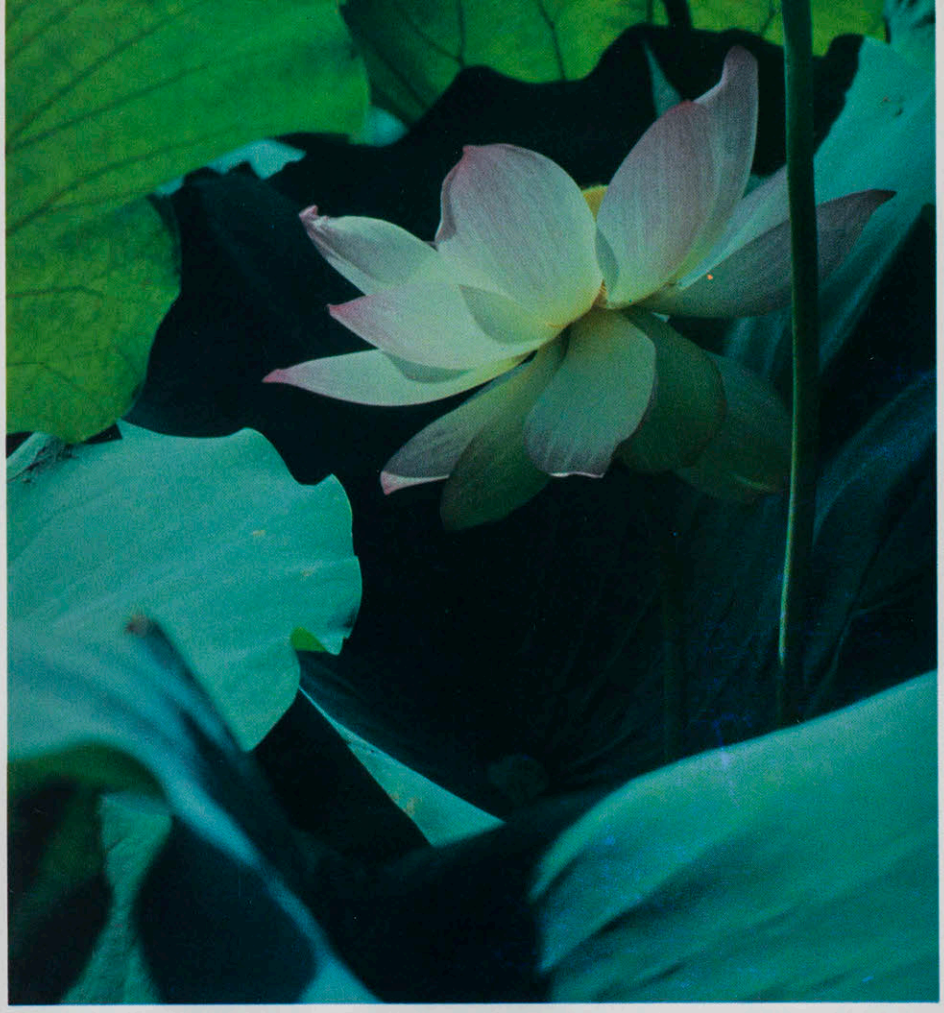
The lotus of India has petals that are white, cream, pink, yellow or rosy-tan in color. The giant peltate leaf lifts above the water on a slender petiole like an oversized umbrella. It is one of the wonders of plant architecture, graceful in the extreme, and

yet incredibly strong. The flower is lifted even higher above these leaves as a great orb that unfolds with the light of day. It is this that has prompted the association of the flower with the rising moon in many Indian texts. The moon is often called "Lord of the lotuses" and "Lover of the lotuses." Flower petals have been used to characterize the eyes of the hero in the *Vana Parva*, and the color of his skin. The shape of each petal suggests the form of the eye, and the tawny-rose color of some forms of the flower are like a rich and glowing skin. To be "lotus-hearted" is to be strong and yet possessed of poetic sensibilities. The giant white ball of petals, almost moon-like, has led to the verses suggesting that the flower is "night-loving." The flower actually expands during the day, revealing a peculiar green pod or fruit filled with large developing seeds.

A fanciful account of the lotus appeared in the English publication "The Botanical Magazine" of 1805. Curtis, the editor, published a story stating that a Hindu entered the study of Sir William Jones, who chanced to have a lotus lying on his desk. The Hindu was reported to have made prostrations before it as though performing an act of piety. The account went on to state that this quasi-religious act pervades Hindustan, Tibet and Nepal. There is not a shred of evidence that this event ever transpired, nor is there any indication that it was an all-pervasive act of piety in the aforemen-

tioned areas. However, the story was to be repeated in many subsequent publications. At this time there is no reason to believe that the lotus was anything more than a symbolic and decorative element in Hindu thought and religion. It is the flower upon which Buddha sits, and some illustrations have suggested the birth of Buddha upon a lotus flower. We might liken these ideas to the poetic use of the figure of Christ as the Rose of Sharon. Neither allusion lends itself to literal interpretation.

Considerable confusion surrounds the name "lotus," and like so many common names used to identify plants it has led to endless debate. To a botanist, *Lotus* is a generic epithet indicating a member of the family Fabaceae. When lotus is used in common parlance it may indicate the genus *Nelumbo* as presented in this discussion (formerly called *Nelubium*). It may also be used to characterize several species of the genus *Nymphaea*, the water lilies of the Old World. At this point I should state that the lotus of the ancient Egyptian dynasties was not *Nelumbo*, but the blue water lily *Nymphaea caerulea*, native to the Nile Delta. *Nelumbo* was introduced by the Persians around 700 B.C., thus the term "lotiform" as used by so



many art historians in their characterizations of ancient Egyptian artifacts and monuments is incorrect. It was the blue *Nymphaea caerulea* that occupied ancient Egyptian thought, making its appearance in three of the four cosmogonies of ancient Egypt.

Apart from its association with aquatic plants, the word "lotus" has been used in classical references to indicate a people and a land where lotus eating was popular. The "lotophagi" did not eat *Nelumbo*, the true lotus, but fed upon *Ziziphus lotus*, a thorny shrub of south Europe which produces fruits the size and shape of a date with a pulp not unlike a pippin apple. The fruits may be crushed and fermented to produce a wine that is fragrant and intoxicating. The Romans knew *Celtis australis*, a tree of the elm family that produces small cherry-like fruits, as "lotus." This discussion should point up the necessity of generic and specific names in accurately characterizing any plant.

Apart from the great beauty of *Nelumbo*, which we may hereafter take to be the lotus under discussion, there were practical reasons for the Egyptians introducing it into the still waters of the Nile delta region. It grows in standing waters where little else could be cultivated. The rhizome, or underground stem, that meanders under the mud has the thickness of a man's arm and is an esculent, or edible, vegetable. When cut into slices it reveals an exquisitely patterned anatomy of rosettes. These rhizomes were used as a source of a fine food, being high in carbohydrates. They are still prized in many areas of the world, especially in China. It is a treat to taste these elegant slices of rhizomes that have been crystalized in sugar. They are also cut into pieces and put into soups and stews. The seeds are about the size of a kidney bean. These are nestled within the peculiar cupules at the top of the cup-like fruit held high above the water. The heavy seed coat allows the seed to remain in an ungerminated state for many years. Inside the testa, or seed coat, there are two succulent cotyledons and a bitter plumule. The plumule is the portion of the seed that will form leaves as the seed germinates. "As bitter as the plumule of a lotus seed" is an ancient Chinese saying. It is this plumule of the *Ho Hua* plant that was extracted by the Chinese for use in medicine. It also found its way into Malaysia where it was used to treat "unlucky fever," and "Wintermittent fever." The unripe seeds of the unopened flowers (at this state of development called *Kan tan*) are eaten uncooked. The ripened seed, minus the bitter plumule, is ground into a flower and sold as *bhasabola*, not to be confused with *bhosabole* which comes from an unrelated plant. This flour compares well with the starch that is sold as "arrowroot," as it is easily digested and is a fine dietary element for children and the infirm. In India the seeds and slices of the rhizome are served fresh with nuts, or are preserved in salt and vinegar for the winter. Lotus seed soup is widely served in fine Chinese restaurants throughout the world. Having enjoyed it on many an occasion, I can attest to its fine and delicate flavor.

The Chinese give a name to every part of the *Nelumbo nucifera* plant, as each finds it way into food or medicine. The stem is *Ch'ien*, the true roots *Mi*, the leaf *Hsia*, the flower *Han-t'ao*, the fruit *L'ien*, the rhizome *Ou*, the seed *Ti* and the caulicle *I*. This proliferation of specific names is indicative of the importance that this plant has had in Chinese history.

Mrs. C. F. Leyel, an Officer of the Academy of France and a Fellow of the Royal Institute, England, has written of the virtues of *Nelumbo nucifera* as refrigerant, diuretic, and sedative. In the rhizomes there is a small amount of nupharine (nupharadine) that acts as a psychodysleptic or a hypnotic, accounting for the sedative qualities. This is the same chemical that is found in a much greater concentration in the

Nymphaea caerulea (blue waterlily) of Egypt and in the rhizome and flower buds of *Nymphaea ampla* in the tropical parts of America. It has been suggested that this chemical played an important role in shamanic transformations in both the ancient Egyptian and Mayan civilizations. Experiments on nupharadine as an isolated compound have demonstrated its opium-like qualities.

After so many clinical observations we may turn to some more romantic aspects of the lotus. The French named an instrument, the *lotos*, after the plant based upon the similarity between the form of the fruit and that of the instrument. If one is in Paris late in the month of June or early in July, it is rewarding to visit the famous gardens known as the Bois de Boulogne. Within this great artificial paradise, in which nature conforms to a romantic ideal of the eighteenth century, there is an even more idyllic spot — the bagatelle. A bagatelle is a small jewel or a mere trifle, but this is a garden within a garden exhibiting false ruins and grottos that anticipate nymphs and shepherds. Among the most beautiful spots in this garden is a small lagoon rich in *Nelumbo*. Out of the dark and murky waters the giant umbrella-like leaves are held aloft, and above these are the surreal globes of pink and white flowers. They are as much a part of this fantasy as would be a satyr or centaur.

One need not travel across continents to see this luxurious blossom, for Los Angeles has one of the most exquisite collections of Nelumbo that I have seen in any botanical garden. In an area known as Echo Park there is a small lake for boaters. It is seated in a cool park of trees in an otherwise densely populated area. Every spring there is a lotus festival to honor the appearance of the flowers of these plants that cover the entire end of the shallow lake or lagoon. When in full bloom, the flowers number in the thousands. Children wade about in the dark waters almost lost under the gigantic leaves as boaters glide along the edges of this fantastic aquatic garden. The ballooning pink and white orbs seem to illuminate the area like some serene Chinese festival. These plants are truly one of nature's most majestic productions.

It is little wonder that John Nicolais sought with his camera to capture the essence of these wondrous lotus blossoms. It is to his memory that this essay is dedicated as his photographs speak more eloquently than any botanical descriptions.

Dr. William Emboden, has published a number of technical papers on Nymphaea *and its use as a ritual narcotic. This is his first assay into lotus land.*

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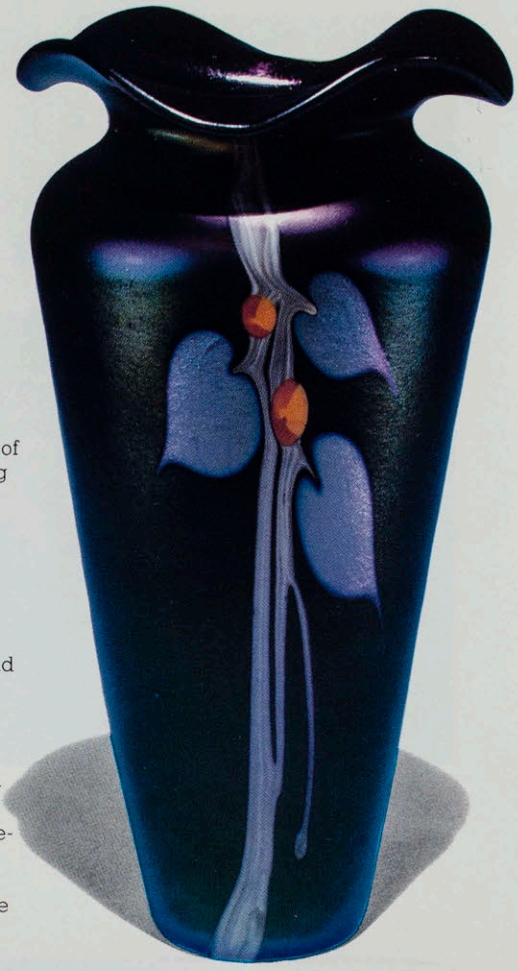
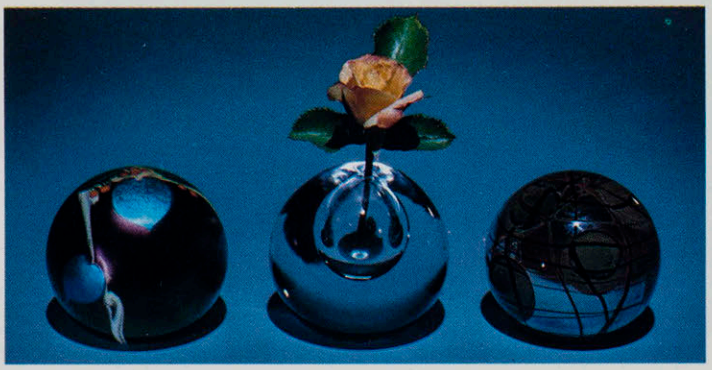


2C Stuart Abelman is one of a handful of artists carrying on the tradition of hand-blown American art glass. His work has received national acclaim, one of his pieces is in the permanent collection of the Corning Glass Museum and he will be pictured and listed in the new Encyclopedia Americana. The vase pictured above is an example of his fine work, measuring 8" high and exhibiting rich, iridescent tones. An exquisite and elegant piece, it is a classic today and will be an heirloom tomorrow. Each piece is signed, dated, and numbered. $115.00

2B The delicate beauty of spring wildflowers is preserved under glass in this unique set of four handmade coasters, each circled with lead and backed with felt. $22.00



2D (left) A companion to the vase shown above, this handsome signed, dated, and numbered paperweight by Stuart Abelman is in the lyrical "leaf and berries" design. $59.00

2E (middle) From Italy comes a beautiful piece that is actually two gifts in one: a clear glass paperweight that doubles as a bud vase. $19.00

2F (right) From glass artist Stuart Abelman, a signed, dated, and numbered paperweight. This design is entitled "windows" and exhibits an interesting three-dimensional effect. $59.00

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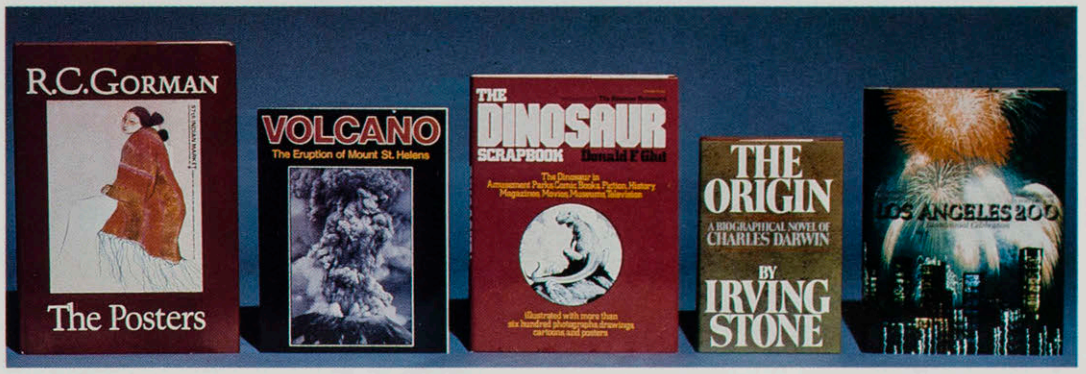

3A R. C. GORMAN: THE POSTERS **foreword by Tricia Hurst.** No art library would be complete without this book which beautifully reproduces thirty-six posters created by the man whose uninhibited, free-flowing style and vivid color sense have led him to be called "the Picasso of American Indian artists." $25.00

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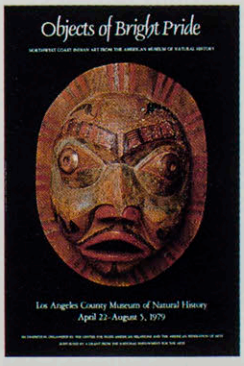

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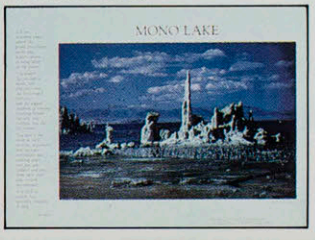

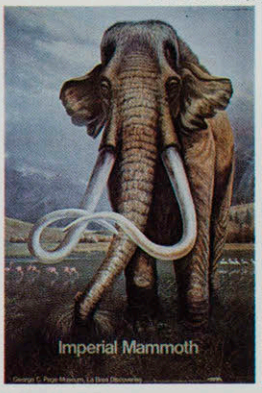

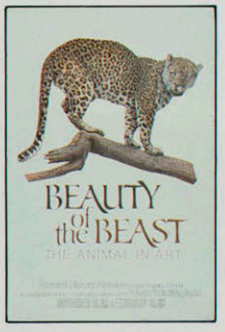

3F OBJECTS OF BRIGHT PRIDE. A Kwakiutl face mask against a black background makes a dramatic poster for an exhibit of Northwest Coast Indian Art. (22½"x 33½") $4.50

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3I BEAUTY AND THE BEAST. Announcing the "Animal in Art" exhibit, a poster of a lovely leopard perched on a branch from an original watercolor by Australian wildlife artist Geoffrey Roberts-Coe. (20"x 30") $3.00

3J AVIATION MEET. Reprinted from an original in our Museum's collection, this attractive poster announces the nation's first international air meet, held twenty miles south of Los Angeles in 1910. (35½"x 23½") $5.00

3K THE LAST WILDLANDS/1981 CALENDAR. John Holmes' breathtaking color photographs of the Mono Lake region with thoughts from Mary Austin, John Muir, and others. Published by Friends of the Earth. $5.95

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SHIPS AHOY

THE FORBES MAGAZINE COLLECTION OF TOY BOATS, 1850-1950

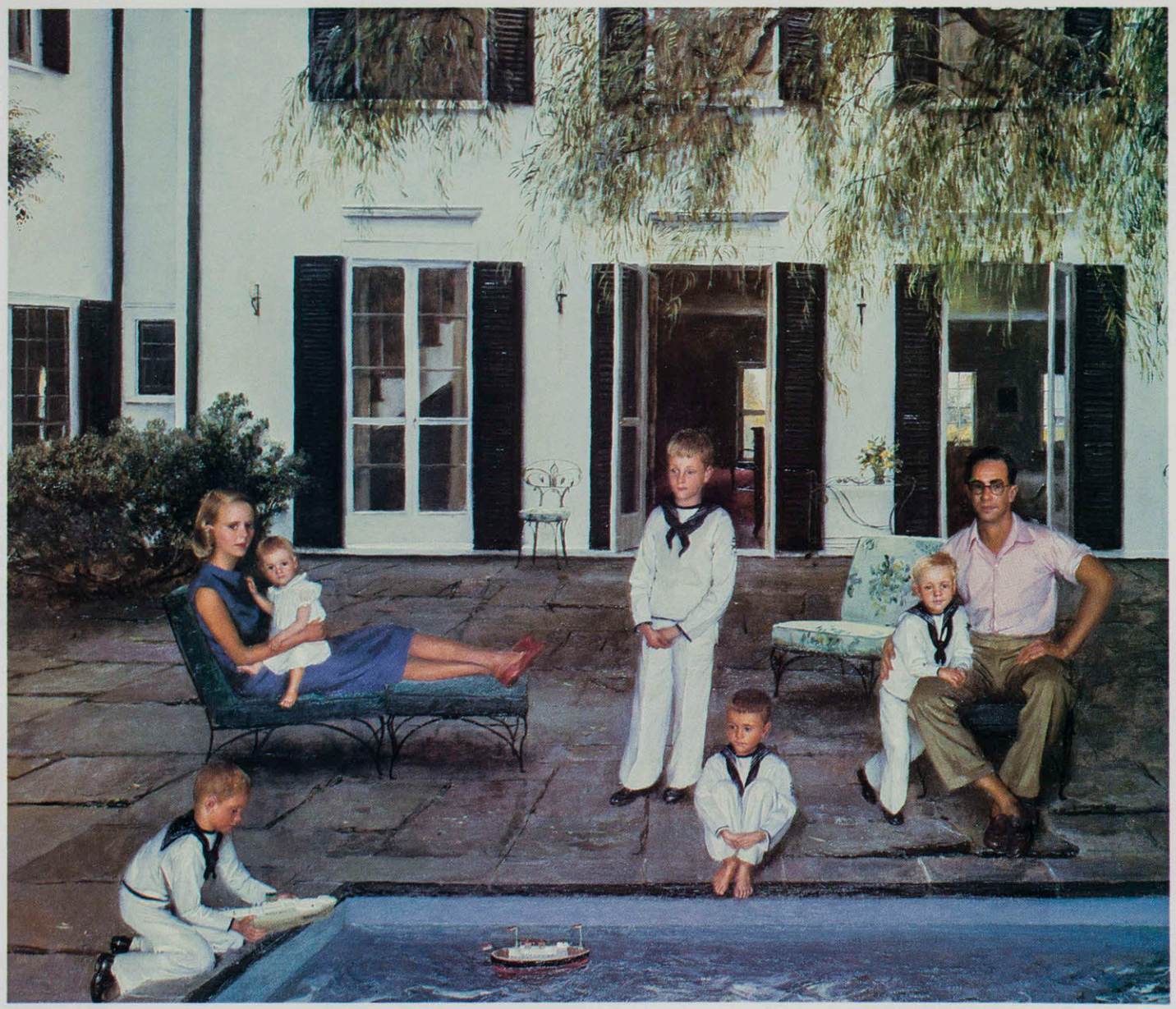
by LESLIE BRAUNSTEIN in association with ROBERT FORBES *Photos by Robert Forbes*

As any child knows, a toy boat and a small body of water offer one of life's special pleasures. When publisher Malcolm Forbes was a youngster, toy boats were among his favorite playthings. On one of many family trips to his father's native Scotland, he leaned over the railing of the large ocean liner and lowered a small toy vessel into the Atlantic, certain that his toy would follow him across the waves. The toy was soon lost, but that youthful attachment carried over to what has become a unique collection of over 300 boats.

The FORBES Magazine Collection of toy boats, manufactured from 1850 through 1950, was shown to the public for the first time at the National Geographic Society's Explorer's Hall in Washington, D.C. last fall. The "Ships Ahoy" exhibit opened in June at the Los Angeles County Museum of Natural History. Even as the collection was publicly launched, a book documenting these toy boats was published by Charles Scribner's Sons. Written by Jacques Milet and Robert Forbes, *Toy Boats* contains some 300 photographs taken by Robert Forbes of the collection which he helped his father assemble for the magazine.

"Trafalgar in a Tub," a late 19th century painting by Charlotte Harding Brown, is reproduced in Toy Boats *to illustrate youth's ageless fascination with tiny boats and ships.*

Forbes, a professional photographer, inherited his father's passion for toy boats. Though none of the boats he owned as a child survived the rigors of his rugged pleasures, his youthful experiences in piloting seaworthy vessels were the inspiration for the collection.



The fact that at least two generations of Forbes men grew up with toy boats says something important about children: whether they're modern kids in jeans or Victorian children in starched ruffles, children like toys which imitate the things of real life. Only the technology that is imitated changes with the years. Thus while today's child plays with toy spaceships, the Victorian child had miniature working versions of that era's riverboats, yachts, gunboats, and ocean liners.

The preponderance of ocean liners in the FORBES collection reflects the latter-day public's fascination with these stately vessels, which reigned over the trans-Atlantic passenger travel market from the Victorian era through World War II. The toy liners, dating from the 1890s, reproduce on a tiny scale much of the big ships' elaborate and detailed grandeur. Inspired by the opulent ocean liners of that era, European toymakers designed painstakingly detailed toys which ranged up to three feet in length. They were fashioned of iron, steel, zinc, brass, lead, tin, and wood. They floated, they were hand-painted, and they were all self-propelled with the aid of steam engines, electric motors, springs, and even rubber bands.

Unlike models, these toy ships were not made exactly to scale. But they were better than models since they could be used in water. This accounted, however, for the disappearance of many of these exquisite toys. "Thousands of toy boats rusted, sank, and sailed into oblivion," Robert Forbes explained. "They also succumbed to corrosion from sea water or the soapy sea of a child's bath."

A toy's owner, too, could be deliberately involved in a vessel's final demise, he noted. "At one point we had about a dozen tin boats," he recalled from his own experience, "but then I got a BB gun." Pause. "It took long and steady aiming."

Fortunately for the world's collectors, Victorian children did not have such extravagant weapons. But they did subject their toys to the hazards of oceans, rivers, and lakes. Consequently, Forbes pointed out, these toys will never be as available to collectors as other antique toys. And although antique toys were not popular collectibles for a long time, they have become much sought after in recent years. A typical antique toy boat in good condition sells for $300 at auctions, he said. The price escalates with the size of the specimen, ranging up to $21,000 recently paid for the *Weissenberg*, a mint-condition battleship measuring 87 cm. long.

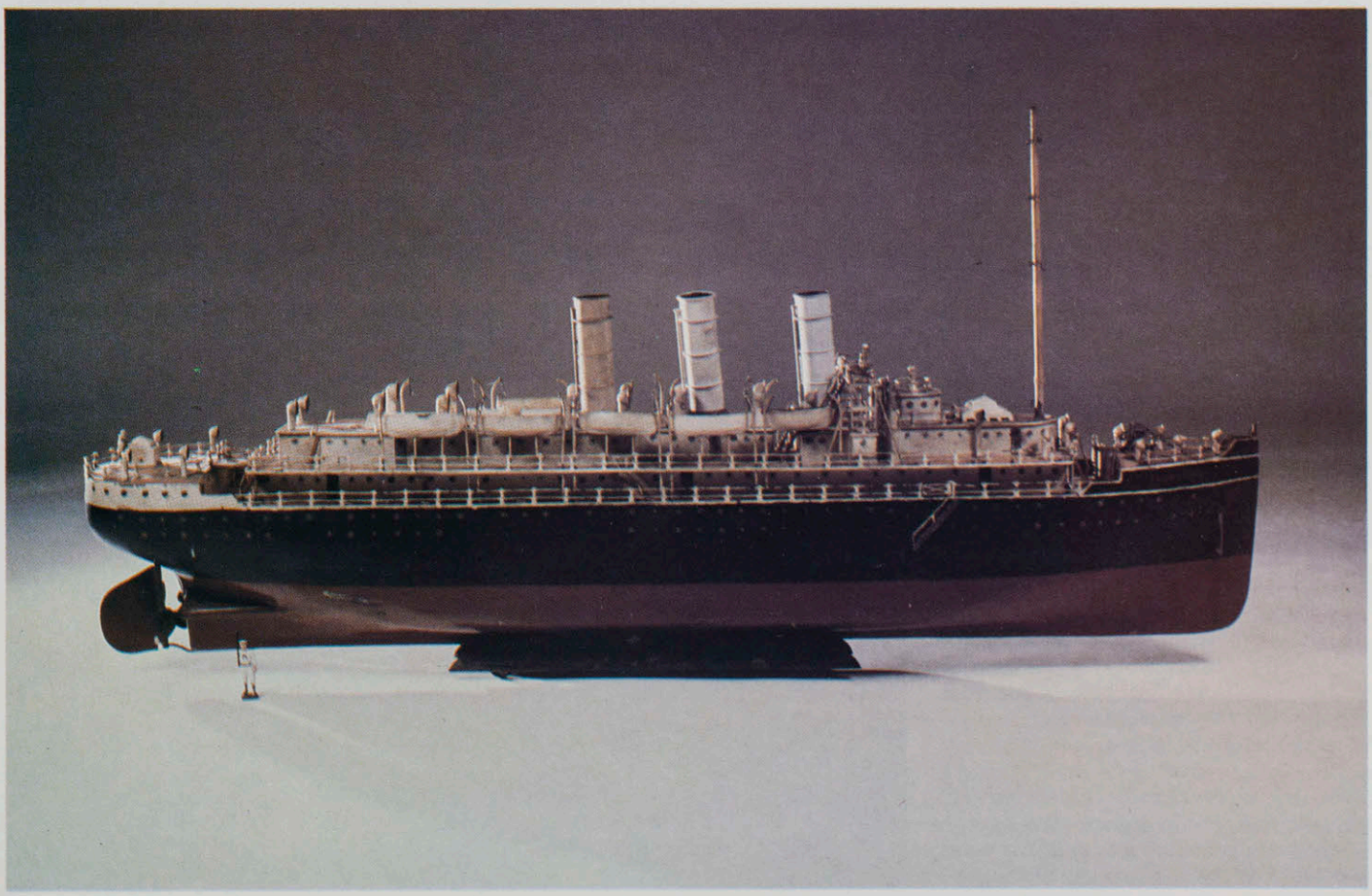
Even when mass-manufactured long ago, of course, many of the boats in the FORBES Magazine Collection were quite expensive: some cost as much as several hundred gold francs at the turn of the century. The best toy boats enjoyed by

OPPOSITE PAGE

A half century separates John Koch's 1956 painting of the Malcolm S. Forbes family from the Victorian-era painting of two anonymous boys, but the children are enjoying the same delightful pastime. All four Forbes boys sport old-fashioned sailor suits; the most serious sailor among them, however, is Robert, shown launching two of his favorite toy boats into the family's pool.

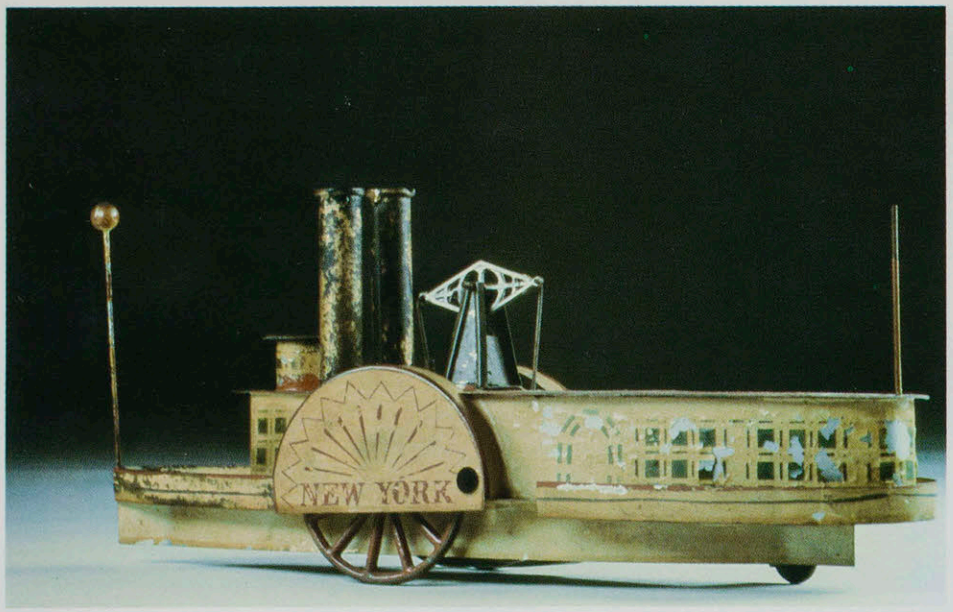
The Weissenberg *set an auction record for a tin toy, sailing off the block for $21,000. Manufactured by Marklin ca. 1905, the hand-painted tin battleship with a clockwork mechanism concealed within, boasts four lifeboats, anchor and winch, bridge, cannons and gun turrets, twin funnels and masts surmounted by banners, and an eight-pointed ship's wheel.*

Marklin's Kaiserin Augusta Victoria *(1912) was one of the company's faithful reproductions of that era's great ocean liners. These toys were produced in sizes ranging from 23 cm. to a meter or more in length; this specimen is a very large 114 cm.*

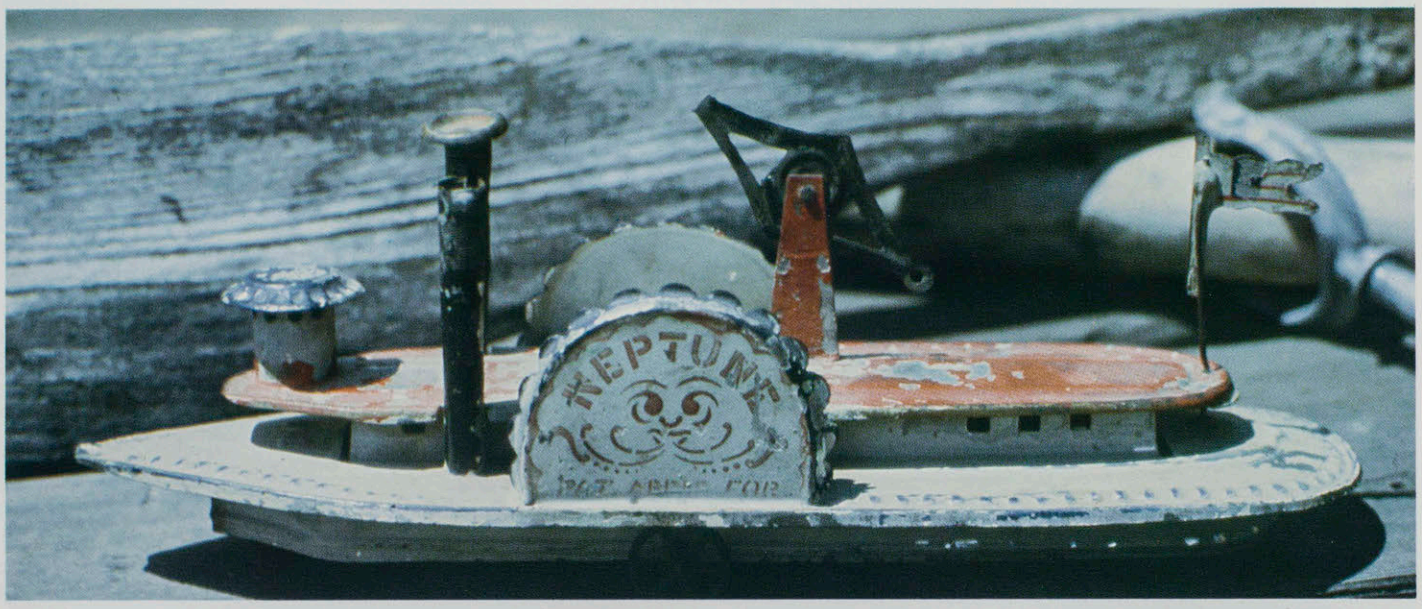


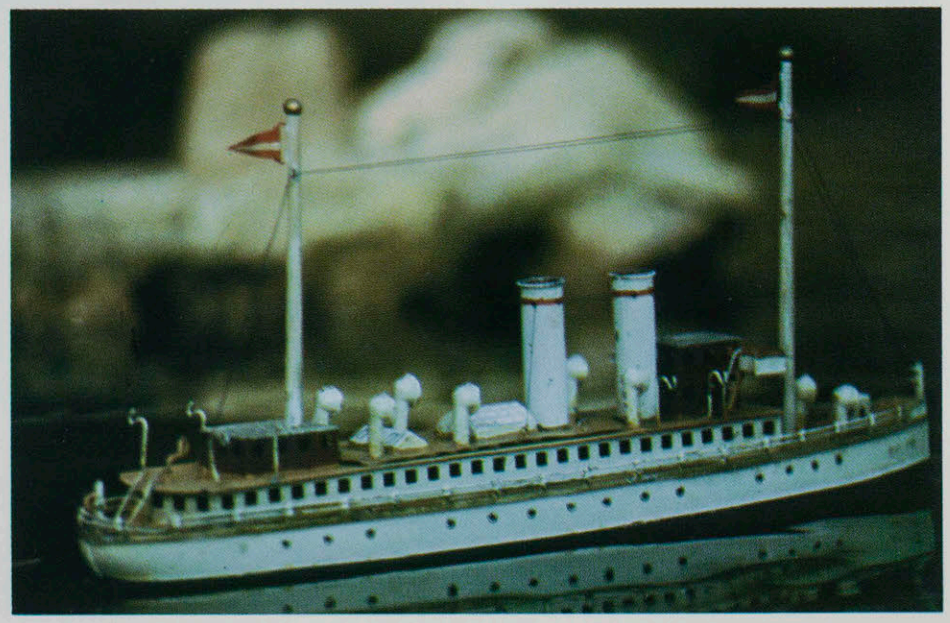
OPPOSITE PAGE

This tin lithograph Noah's Ark (28 cm.), dating from 1910, is one of the most unusual toy boats in the collection.



Toy riverboats are among the oldest items in the FORBES collection. The New York *measures 35 cm. and is thought to have been produced by the Brown Company, or Brown and Stevens, sometime between 1860 and 1870. James Fallows & Co. produced the 29 cm.* Neptune *during the same era.*





Another example of the early Marklin ocean liners is the Spree, *dating from 1912 and measuring 42 cm.*

children throughout the industrialized world were exported from Nuremberg, Germany, which emerged near the turn of the century as the center for high-quality toy production.

The Marklin Company, founded in Nuremberg in 1859, was the toy boat industry's indisputable leader for almost a century. Marklin's ocean liners included details such as removable lifeboats, steering bridges, lead anchors, and hand-painted crewmen. The company offered a choice of three propulsion systems: a twenty-minute clockwork motor, a one-hour steam engine, and a six-hour electric motor.

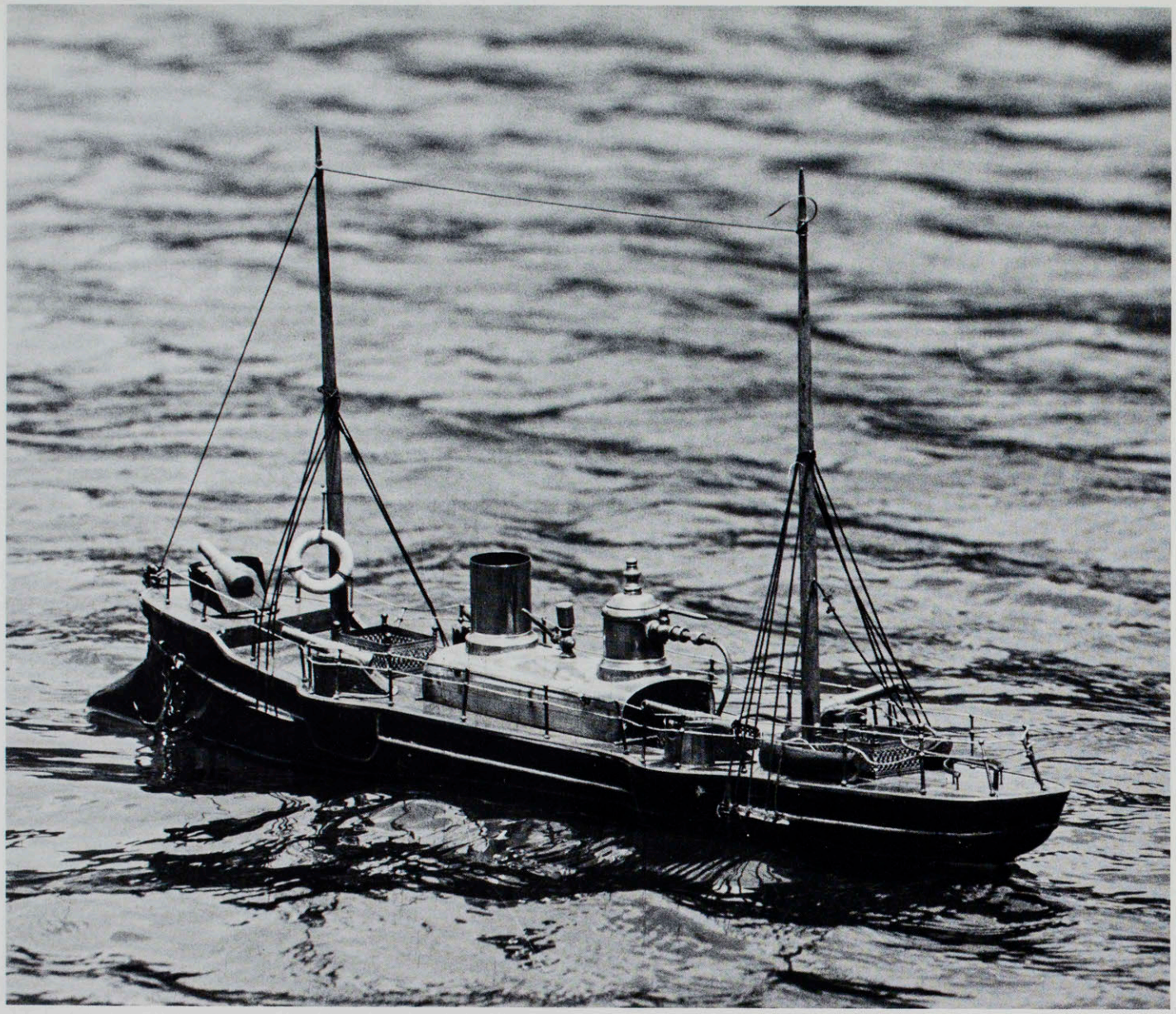
The other leading Nuremberg toy boat manufacturers were Bing, Fleischmann, Carette, Arnold, and Falk. The Fleischmann firm began producing toy ocean liners circa 1900, closed down during the First World War, and produced toy boats until 1955 except during the Second World War. The firm still manufactures toy trains today.

Transplanted Frenchman George Carette worked in Nuremberg with Gebruder Bing before founding his own firm in 1886. A number of restored and unrestored Carette boats are in the FORBES collection. They often can be identified by the wind-up keys emerging from their distinctively tall smokestacks.

One of Carette's workers, Joseph Falk, founded his own firm in 1913. Falk's boats are distinguished by short smokestacks. Yet another manufacturer, Karl Arnold, often added the distinguishing feature of a wind-up mechanism emerging from the boat's stern.

Although German firms led the industry, American and French firms also produced toy ocean liners. The clockwork-driven ships made by Ives, an American Firm, were advertised with the slogan, "Ives toys make happy boys." Originally a toy train manufacturer, Ives did not succeed financially with his toy boats. Nor have the boats lasted well either. Author Milet points out that their paint peels easily because they were not painted with a primer.

In addition to producing toy ocean liners, these firms also produced a wide range of battleships and submarines. Warships sported tiny toy guns, some of which could be loaded with gunpowder and fired. Submarines could travel underwater, and some could fire torpedoes. Advancing the popularity of toy battleships was the fact that the German government encouraged the production of bellicose playthings. In 1898, according to the Milet-Forbes book, the German army placed newspaper advertisements calling for the manufacture of more war toys. And in 1913, according to a Berlin newspaper account quoted in the book, the German Kaiser stormed out of a large toy



store in that city after having sketched a design for a toy submarine which he recommended manufacturing. The Kaiser is said to have told the store's clerk: "It is necessary that young Germans understand well that the German maritime strength is invincible, and that the future lies not only on but under the water."

With such convincing support, Nuremberg's toy manufacturers expanded their production of warships and submarines. Once again Marklin led the industry with its exquisite hand-painted cruisers and gunboats. The *Indiana* was typical of the smaller Marklin boats produced between 1859 and 1906. It sports two small cannons, which could be loaded with gunpowder and fired with a fuse. Though made in Germany, the boat sports an American name. However, for obvious marketing needs, it could have been called the *King Edward VII* in an English toy store or the *Kaiser Wilhelm* in Germany. Larger Marklin warships, ranging up to 104 cm., commanded prices of up to 300 gold francs.

In addition to Marklin warships, the FORBES collection includes similar toys produced by Fleischmann, Carette, the French firm of Radiguet, and the American firm of Samuel Orkin. From his Massachusetts factory, "toy wizard" Orkin produced long-lasting toys modeled after early U.S. battleships such as the *New Mexico*, the *Nevada*, and the *Texas*.

In contrast to the battleships and submarines with their no-nonsense guns, latter-day toymakers also produced whimsical items, a variety of which are presented in "Ships Ahoy." For example there's the American-made Zippee speedboat, powered by a balloon attached to a tube emerging from the boat's stern. There's the wooden Amphibo boat-on-wheels, powered by a rubber band, which won a French toy inventors' contest in 1906 and went into production soon afterwards. There are sailboats with sails made of paper, cloth, and tin. There's even a toy boat made into a lamp, with a clear bulb revealing a glowing filament in the shape of Popeye the Sailor.

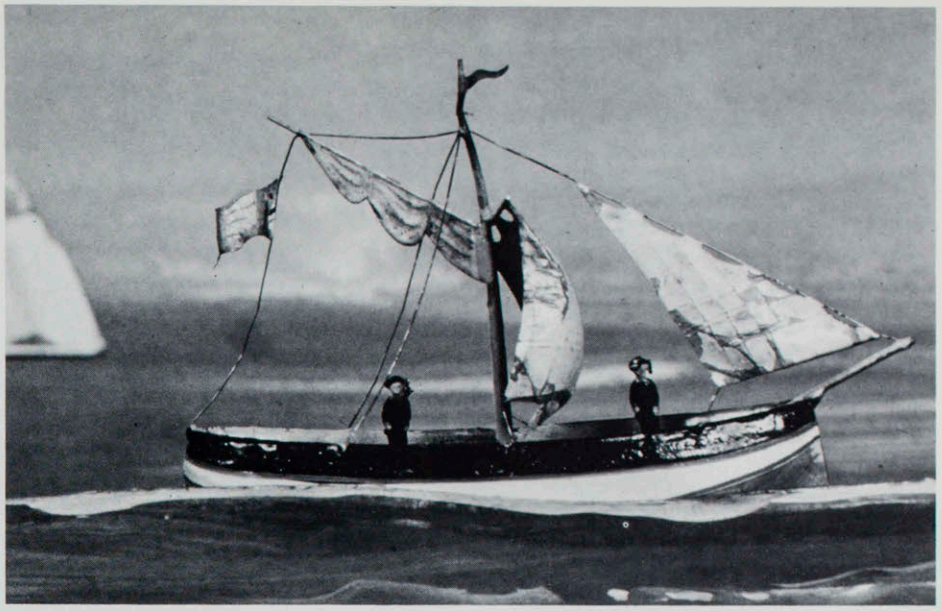
Perhaps the most colorful "novelty" boat in the collection is a spring-wound gunboat made of tin, its surface lithographed in a floral design. It was manufactured to celebrate the Japanese victory over the Russian Navy in 1904. Milet points out that tin litho toys, once scorned by collectors, are now highly valued and increasingly hard to find.

The oldest items in the collection are toy riverboats, such as the *New York*, a 35 cm. toy manufactured in the U.S. during the 1860s. The tin lithograph *Noah's Ark* is another unusual specimen dating from 1910.

However, the FORBES collection does not stop with turn-of-the-century his-

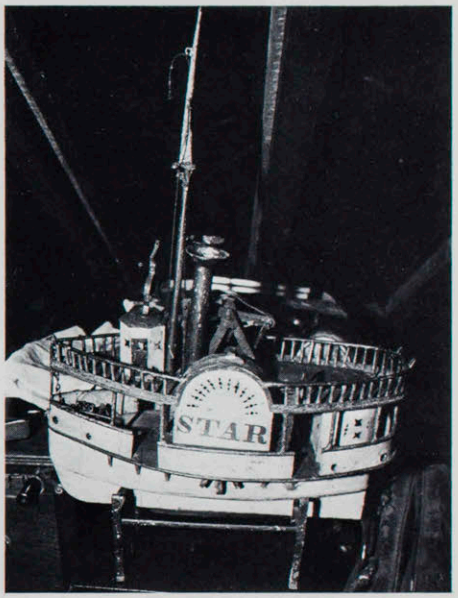
OPPOSITE PAGE

This 79 cm. warship was produced by the French firm of Radiguet and Massiot in 1880. It sports small brass cannons that can be set off with gunpowder. Its steam engine system was made of bronze, steel, and brass.

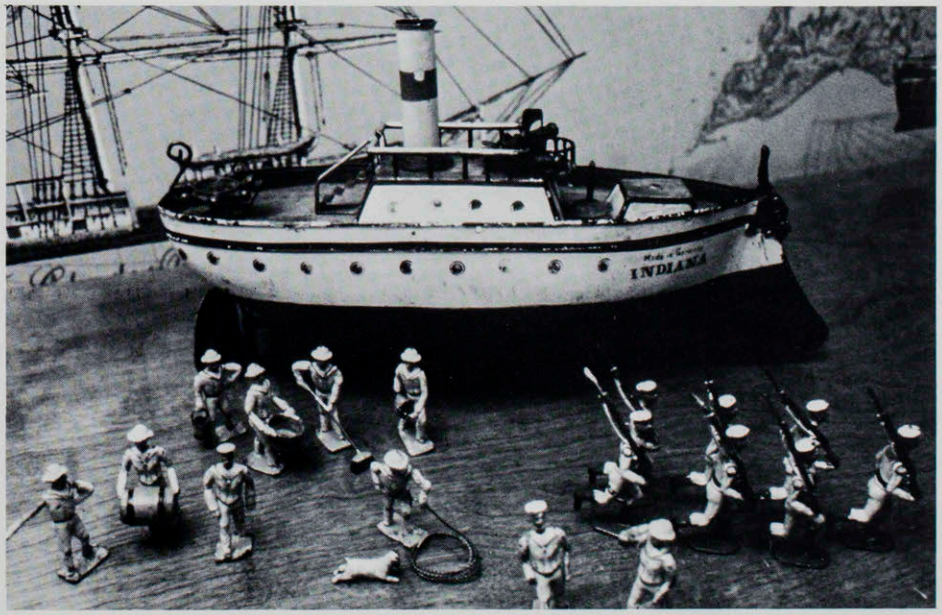


Falk's tiny toy sailboat is made entirely of tin.

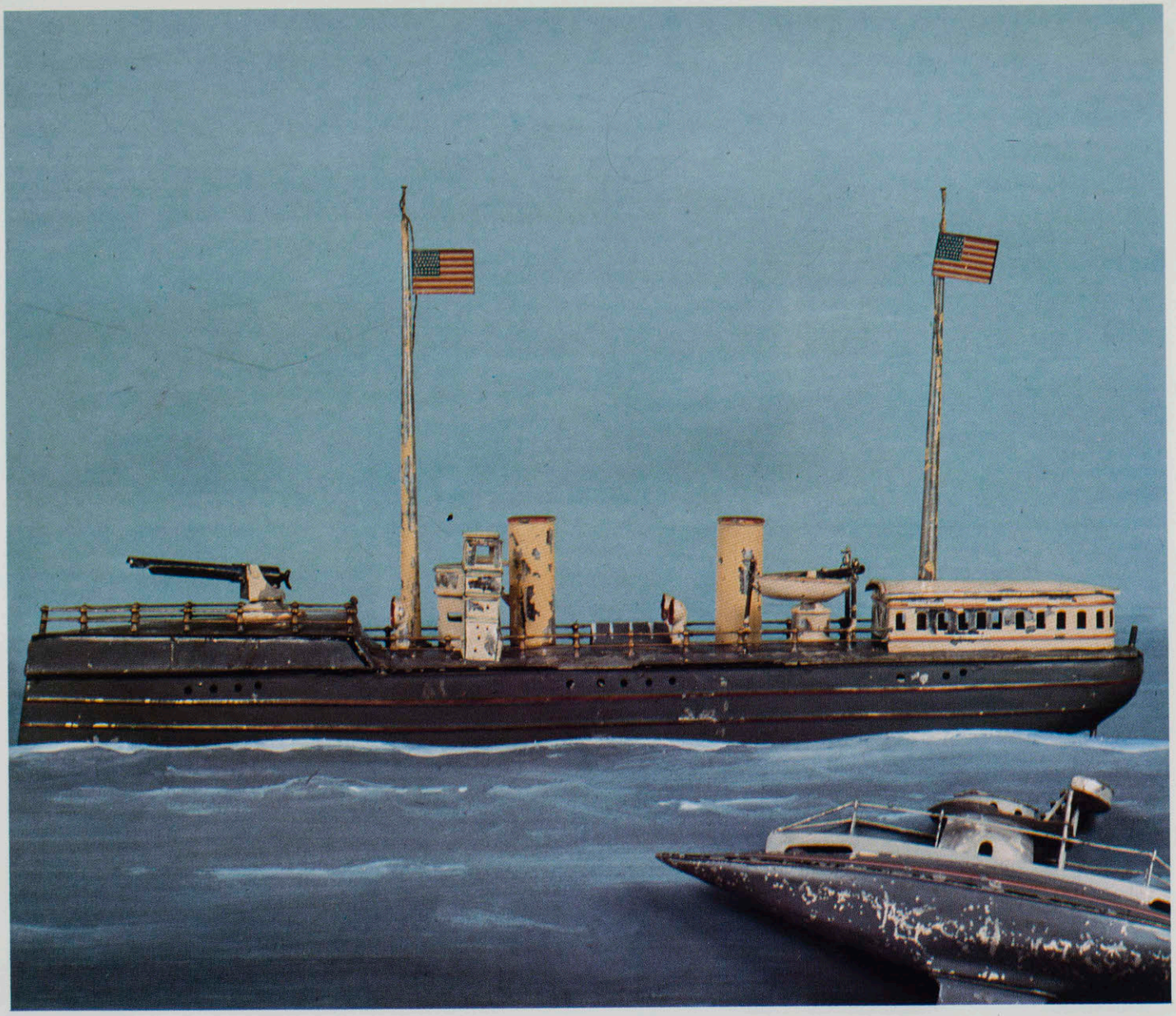
This small (27 cm.) inexpensive clockwork-driven toy was produced in the U.S. by Ives in 1869. It was called the Warner Single Oarsman after its inventor.



The Star, *a toy paddlewheel boat patterned after the Mississippi steamers, dates from the mid-nineteenth century. It is not known whether* The Star *is a toy or a model.*



The Indiana, *shown here with a crew of lead sailors and officers, is representative of Marklin's smaller warships produced from about 1900 to 1906. This 33-cm. item, produced in 1902, has two small cannons that could be loaded with gunpowder and fired. Fortunately for today's toy collectors, there were no federal consumer product safety agencies at the turn of the century.*



tory; it covers toy boat manufacturing through the 1950s, including the splendid ocean liners of the 1920s and the fierce submarines produced just before the Second World War. The history of toy boats ends with that war, not only because production ceased during the war years, but also because air travel replaced most forms of sea travel, and toy airplanes captured children's fascination just as the world's great ocean liners were being removed from service.

Today there is a new wave of interest in both the once-great ocean liners and their toy counterparts. The Smithsonian Institution's Cooper-Hewitt Museum in Manhattan has presented a comprehensive exhibition of ocean liners' designs, blueprints, and trappings, including large models of ocean liners and photographs of their sumptuously decorated interiors. Murals, panels, furniture and other objects remaining from great ships like the *Normandie* bring ever-higher prices as they change hands. And antique toy boats, as Robert Forbes pointed out, are in great demand by collectors; demand is certain to intensify as a result of the "Ships Ahoy" exhibit.

As a mitigating factor, however, the exhibit and book may inspire more people to seek and discover forgotten toys in attics and basements. The book can help would-be treasure-hunters identify the many types of toy boats manufactured between 1850 and 1950.

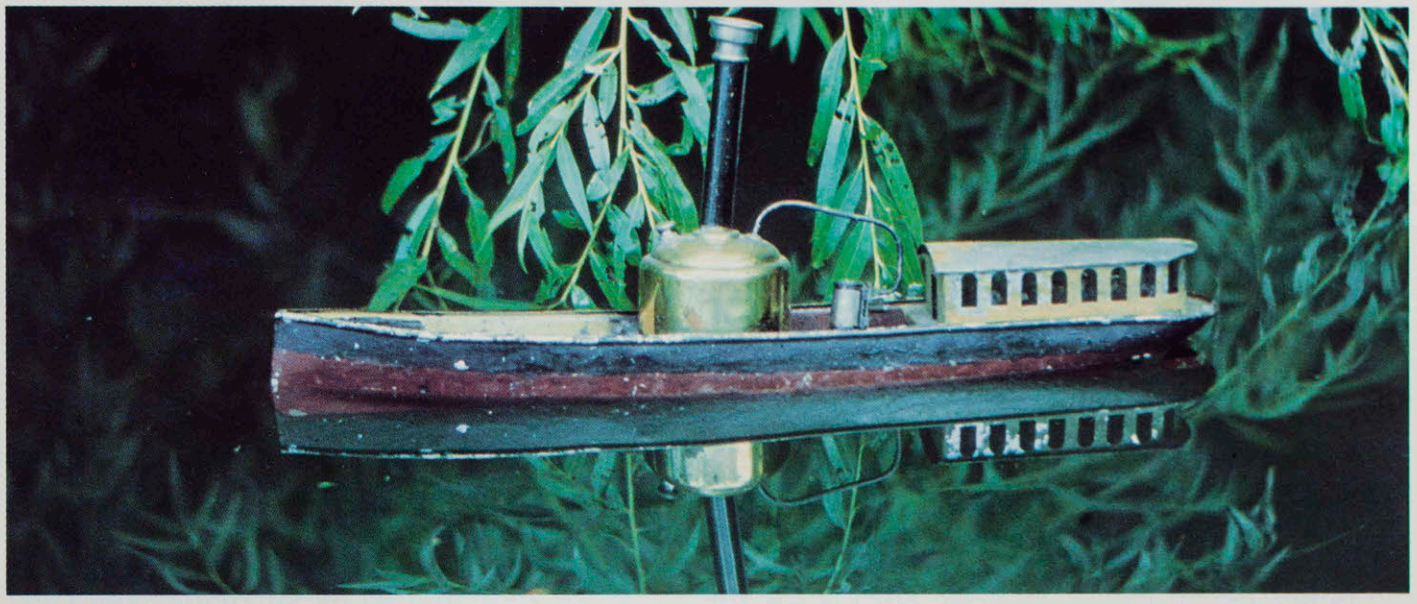
For most people who appreciate the history and lifestyle of the Victorian era, however, it will suffice to view the many toy boats in the FORBES Magazine Collection, and imagine how they might have been put to use by the children of that era. Unfortunately, one cannot view the boats in action, or even in water; one must trust that they are seaworthy. Nonetheless, the exhibit manages to communicate some of one family's abiding love for toys which sail, sputter, and churn their way across bathtubs, pools, lakes, and ponds. "The excitement of boats tells of centuries-old yearning to go down to the sea in ships, to sail for foreign lands, or to do battle with imperial fleets," Robert Forbes writes. And Malcolm Forbes summed up his own reasons for collecting toy boats by saying, "The things of childhood have a lasting impression throughout one's life. If they are playwithable, imaginative, and beautiful, it's important."

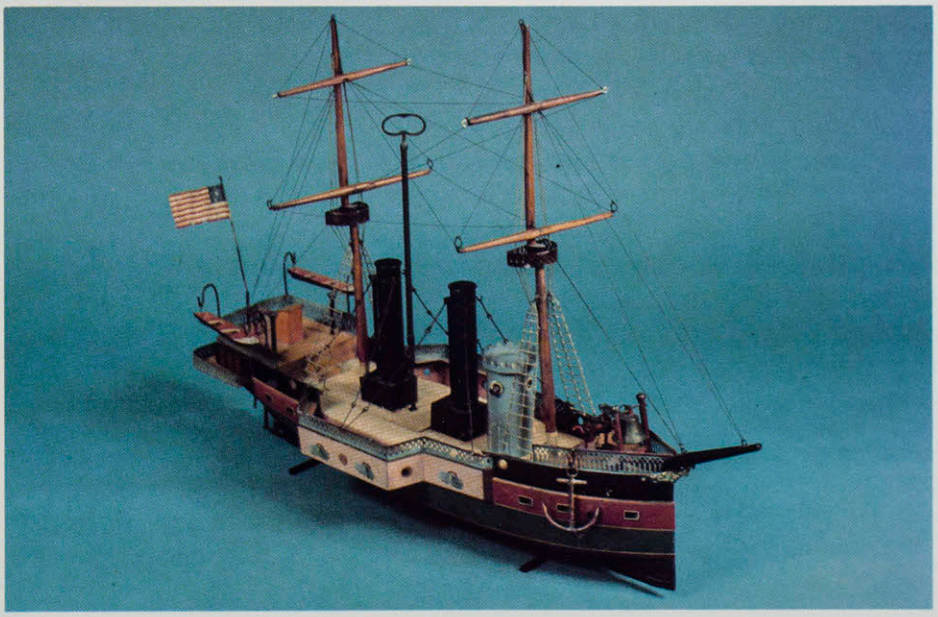
Leslie Braunstein is a free-lance writer based in Washington, D.C. Her articles have appeared in a variety of U.S. and international publications. She recently served as Washington editor of Antique Machines and Curiosities, *a British publication.*

OPPOSITE PAGE

This 51 cm. Carette gunboat was produced in 1904. A characteristic detail is the distinct style of the deck gun. Some Carette toys from this era had a small compass on the stern, and most could be wound up with a key emerging from one of the smokestacks.

The Schoenner Company sold this inexpensive shipbuilding kit around the turn of the century. It contained flags of all nations and directions in three languages.





This small toy boat was produced by the German firm of Jean Schoenner in 1898. It has a steam engine.

Throughout the 1890s, the Marklin Company produced a mostly peaceable fleet. Its warships, like the 76 cm. specimen shown here, were similar in structure to its pleasure boats and ships. This 1895 toy has one small working cannon and a turret that turns. Guns intended for the other holes are missing, but the boat still has a working double winch, and rope ladders made of cast lead.

Charles Darwin Visits the Galapagos

An important excerpt from Irving Stone's new novel "The Origin"

IRVING STONE TALKS ABOUT "THE ORIGIN"

The Origin took five years to research and write. During the project we had the wholehearted approval and cooperation of Charles Darwin's descendants. These included Lady Nora Barlow, Darwin's last remaining granddaughter and the editor of Darwin's manuscript, "Diary of the Voyage of the Beagle"; George Darwin, Charles' great-grandson, in charge of Darwin's literary estate; and Richard and Milo Keynes, great-grandchildren of Charles and Emma Darwin.

My wife, Jean Stone, is the editor of *The Origin.* She and I visited every major port reached by H.M.S. Beagle, with the exception of Tierra del Fuego. However, Charles Darwin wrote so brilliantly about the Beagle's forcing of Cape Horn, and of his adventures with the aborigines, that the loss is scarcely noticeable.

We spent three successive spring-through-summer sessions at the Cambridge University Library, where the majority of Darwin's manuscripts, correspondence, diaries, and journals are housed. The Darwin Library at Cambridge was wonderfully patient and helpful during the full five years of labor, even answering all spot questions during the years of final writing in California.

For the first two years of our sessions in England we rode out on a daily basis to Charles Darwin's old home, Down House, in Kent. During the third year we were invited by Sir Hedley and Lady Judy Atkins, who restored Down House for the Royal College of Surgeons, to live with them in the house for several weeks in order to gain an intimate sense of the dwelling, the gardens, and the Sandwalk, which Darwin called his "thinking path."

The best of this remarkable experience was the opportunity offered by Sir Hedley to sit in Darwin's own chair in his library, with the plank across the arms, and study a first edition of *The Origin of the Species* and *The Descent of Man,* in the exact spot where the two manuscripts had been written.

The Origin is completely authentic in its historicity. It is a biographical novel in form, which means that some of the master scenes, scenes of confrontation, have been dramatized. Some minor parts of the dialogue have been derived from letters, diaries, journals, but the great body of historic fact in the book, including the life and work of Darwin's scientific friends, Thomas Huxley, Joseph Hooker, Charles Lyell, Adam Sedgwick, and Alfred Russell Wallace, is derived from solid documentation.

He looked forward to visiting the Galápagos, the Islands of the Tortoises, named after the giant land tortoises which had been discovered by accident by Bishop Berlanga, sent out by King Charles I of Spain, whose becalmed ship had drifted six hundred miles from the mainland of South America...right up to the group of volcanic islands. His major excitement, he told John Stokes "is for the sake of climbing an active volcano."

After the bishop's unintended visit, no sailing ship had ventured near the Galápagos for a century and a half, although they were indicated on the maps of Ortelius and Mercator in 1587. The few who knew about them steered clear of their dangerous reefs; their uncanny appearance of being unhinged and floating about in the Pacific. Until the whalers and buccaneers found that they contained fresh water and literally thousands of giant tortoises which could stay alive stacked half a dozen high in a lower deck, providing fresh meat for months. The islands then became so traveled that a post office was set up, a barrel in the crotch of a tree, where sailors could leave mail to be taken and delivered by the first ship going to the required homeland.

They had sailed a thousand miles in eight days and were anxiously looking for land when the lookout cried from the masthead, "Islet dead on course, sir." He had spied the summit of Mt. Pitt, at the end of Chatham Island. As the breeze and current carried them onward, the tops of other hills appeared. They paused momentarily at Hood's Island to lower a whaleboat so Mr. Chaffers and Midshipman Mellersh could go exploring for anchorages. In a cove at Chatham a whaleboat was lowered with Lieutenant Sulivan in charge of ten seamen to map the central islands of this group of eighteen volcanic relics. The men discarded their heavy clothing in the heat of the rays of the vertical, equatorial sun and sultry sea.

To Charles, at first sight, the islands appeared utterly desolate, sloping symmetrical cones of black lava completely covered with leafless brushwood and stunted trees. That was the end of his discouragement, for when *H.M.S. Beagle* anchored in St. Stephen's Harbor off Chatham Island, he found the bay abounding with fish, sharks and turtles popping their heads up out of the sea. His line went over the side with the rest of the crew's and he immediately began pulling up fine fish, two to three feet long, the heavy catch flapping all over the deck. After the midday meal he climbed ashore with King and Stokes; the day was glowing hot, the black lava resembling Annie's stove at The Mount. He was astounded by the enormous family of reptiles living on the lava, not only the hard-shelled, slow-moving tortoises, the tiny head stuck out on its short thick neck from a stone-hard plated carapace, but the slithery creatures on the low-lying rocks, thousands heaped upon each other five and six deep: "Disgusting, clumsy lizards, black as the porous lava they're lying on," he exclaimed. "I didn't know they were living creatures until I came within a couple of feet of them."

Stokes grimaced at the uncanny sight:

"I've heard them described as 'imps of darkness.'"

Charles turned away without attempting to capture one. He preferred to botanize, climbing the slope of a dead volcano and gathering ten different specimens, "so insignificant and ugly," he cried, "that Professor Henslow will think I have been gathering in the arctic instead of the tropics."

They also smelled unpleasant.

What did delight him that first day was the variety of birds, species he had not seen before.

"All new, all different! My ornithology friends in England are in for a treat."

The birds were so innocent of man, and unafraid, that King killed one with his hat, and Charles pushed a large hawk off a branch.

The finds on the following day, from a different Chatham anchorage, were equally overwhelming: the black rocks at the shoreline crawled with an infinity of bright red crabs, the sandy areas were alive with sea lions honking great noises at each other between graceful swims in the sea.

He exclaimed:

"The island looked dead from a distance but what an immense variety of life has been created here."

He and Stokes walked to the top of a large but low crater. The country to the north was studded with small black cones which Charles described as ancient chimneys for the subterranean melted fluids. Using his hammer, he quickly ascertained that the volcano they had climbed had once been submarine. He chipped away samples of hard sandstone composed of volcanic dust.

Each day in the Galápagos provided separate adventures as the *Beagle* made its way from anchorage to anchorage surveying the different islands: Chatham, James, Charles, Narborough, Albemarle, the highest and boldest of the volcanic peaks, its east side black with lava, sterile and dry, studded with small craters which were appendages to the great volcanic mounts from which the black lava had flowed. Charles frequently took his bedroll and a tent ashore accompanied by one or more of his shipmates. They bivouacked under a miserable little spring of water in a small valley; crossed black sand which was disagreeable to pass over even in thick boots, and brown sand which registered 137° when they placed a thermometer in it, as high as the thermometer could register!

On James Island their walk was a long one. About six miles to an elevation of 2000 feet, very dry, very hot, the trees low and crooked and nearly leafless but of a larger size than he had thus far observed. At 3000 feet they found the only watering places on the island. Clouds hung over this highest land; the vapor condensed by the trees dripped down like rain. It was wonderfully refreshing. Sometimes they made "wet landings," onto narrow, shallow beaches, rolling their loose bottomed pants above the knees, tying their shoes around their neck by the laces, the socks stuffed inside, slipping off the side of the whaleboat after waiting out the incoming wave to wade ashore, the water high on their legs as they picked their way over pumice rocks and pebbles. Sometimes they approached a sharply inclining lava cliff, fingernails and toes holding onto weathered crevices in the near perpendicular walls.

Since the crew members had been bringing back ten to fifteen giant tortoises a day, he and Syms tried to lift one. All they got

for their pains was a solid hissing before the enormous antediluvian creature pulled in its head and began to move pachydermously away. Charles stood on the tortoise's thick-crusted shell but this did not stop its inching forward.

"In fact," he said with a grin, "he hardly noticed! I wonder how old he is. It's said they can live for hundreds of years. This cactus they chew on must be Ponce de Leon's Fountain of Youth."

The geology was instructive and amusing: craters of all sizes and forms studded about in every direction; some so tiny they might properly be called specimen craters. There were layers of volcanic sandstone, streams of lava naked, black, rough and horrid, grand fields of trachytic lava containing large crystals of glassy, fractured feldspar. The streams were mostly naked of water, their age marked by the presence or absence of foliage; he now believed every plant or tree was in flower or leaf, brown being its prevalent color. Some of the craters were high hills, getting greener as one ascended the peaks, these upland green valleys frequently capturing a refreshing southerly trade wind.

He explored the black cones of craters which resembled the ironwork chimneys at Wolverhampton, large circular pits, "which were probably produced by a volume of gas at the time when the lava was liquid."

He exclaimed joyfully,

"It's always delightful to behold anything which has long been familiar, but only by description."

One night he slept on the beach, then spent the next day collecting a variety of black basaltic lava, volcanic dust, ancient shells, insects he could describe but not name; cactus, brushwood, birds, the marine iguana which he had at first found disgusting but now admired for the way it glided into the sea for sustenance, evaded its only enemy, the shark, and returned to bake in the hot sun. In this hot tropical sun Charles's hair became a goldish red, as in the cold of Tierra del Fuego the color had frozen out to leave it dark.

He had failed to anticipate the breath-taking beauty of the archipelago: the brilliant blueness of the sky and sea; the rich plumage of the myriad birds: frigates with their inflatable orange or red throat pouches, penguins, the clean white masked and blue-footed boobies; the flightless cormorant with its truncated, useless wings, the waved albatross, lava and swallow-tailed gull, the red-billed tropic bird, the night heron, finches; the little pools where baby seals romped playfully, the massive bull sea lion flopping up to the best flat rock on the promontory, where his females could gather round him; the sea turtle digging a hole in the sand to deposit its eggs; the birds dropping their eggs on meager stick-nests on the hard lava ground or in their mating places high on the pock-marked, scarified pumice cliffs; the thick, stumpy-legged tortoises looking like inhabitants of another planet; the sounds of birds, reptiles, fish and sea animals. And very high up, the green foliage where the Palo Santo, the Button Mangrove, Matazarno had taken hold in the earth that the winds had blown in over the aeons; the tall, distorted cactus trees, peculiar rugged cactus whose large oval leaves formed connecting branches. The blowholes where the sea erupted like geysers; the submarine cliffs descending as far as two miles to the bed of the ocean; circular lakes, cliffs sculptured by wind and sea into fantastic columnar shapes.

The several hundred species of fish was incredible; and on the shore line, in addition to the Sally Light-foot crabs, were starfish, sea urchins, sand dollars, sea cucumbers, all shimmering in the intensely white heat.

He found only one live, smoking volcano. When he climbed the rim he observed that there was no flaming fire or liquid lava. It was obvious that neither the numerous volcanoes on each island, nor the islands themselves had been formed at the same time, each island consisting of many separate and distinct lava flows which had poured down the flanks of the volcanoes, many reaching the sea. The weird, dramatic, multi-volcanoed structure of the islands, the tumultuous life in the sea, in the air and on the shell-crushed beaches, made them appear to have been created during one of God's early experimental stages, before He quite knew how He wanted to shape and populate the earth.

It was not until *H.M.S. Beagle* anchored in a cove in Charles Island that he got his first glimpse of the true significance of the Galápagos Islands. Part of it was his own discovery; by studying the finches he had caught on two different islands, he found that they unexpectedly had differently shaped beaks. The second half of the awakening was provided by Nicholas Lawson, the acting English governor who had been appointed when Ecuador claimed ownership of the islands only a couple of years before. Lawson's hair and face were fried red by the sun but he loved the islands for the beauty of their stark black cliffs, clear lagoons, the variety of wild life.

He was at the port of Charles Island to visit a whaling vessel and offered to show Charles the way to the settlement of some two hundred exiles who had been banished from Ecuador for political crimes against the state. During the four-mile walk along the cinder path to the center of the island, they passed a number of tortoises moving at the rate of four miles in twenty-four hours.

Lawson commented:

"I maintain that I can at once tell from which island any one of these tortoises was brought."

Charles pulled up short.

"Are you suggesting, Mr. Lawson, that each island produces its own special kind of tortoise?"

"No question about it, Mr. Darwin. I learned how to identify them more'n a year ago. The tortoises of the various islands differ chiefly in their carapaces, different island forms having consistently higher or lower domes on their shells, and distinctive flared margins at the front and back. The carapaces differ too in color and thickness. The tortoises on different islands also grow to a different dize, have longer or shorter necks and legs."

Charles was confounded by the phenomenon, and asked Lawson. "Why and how would they change their characteristics?"

The consul's voice sounded as though his throat too had been blistered by the implacable sun.

"I couldn't say, Mr. Darwin. I only know what my eyes tell me."

The puzzle stuck in Charles's mind the way burrs had stuck in the fur of Pincher when he walked him along the river Severn. During the several hours that he spent with Lawson in the

Irving and Jean Stone at Garden House, Cambridge, England. The Stones stayed there while doing research for "The Origin" at Cambridge University Library.

pueblo of thatched roofs, makeshift dwellings resting on poles, with patches of sweet potatoes and plantains, the riddle of the differing tortoises bedeviled him. He sat on a log near the natural spring where the turtles and tortoises got their fresh water, a scarcity in the islands because the porous lava rock would not hold the rainfall. Many of the prehistoric monsters traveled upward with outstretched necks as another set returned, having drunk its fill. He watched the tortoises with their heads buried above the eyes sucking in great mouthfuls of water.

"I've been remiss," he decided. "I've put my finds from these islands in the same bag without identifying their place of origin. If there are differences in the beaks of the finches and the shells of the tortoises, I must exercise extreme care to label each island's collection quite scrupulously. In that way I can make comparisons, learn if all the species, birds, lizards, plants, vary from island to island. That could be the most important discovery of my journey. What causes these differences? 'Ay, there's the rub.' "

Of the thirty-six days the *Beagle* spent charting the Galápagos, Charles spent twenty ashore. The burrows of the land iguana, two to three feet long, which was so scaled with yellow, pink and purple shadings that its very ugliness appeared beautiful, were so numerous that the men sometimes had difficulty in finding a spot to pitch their tents. These oversized lizards lived entirely on berries, leaves, for which they frequently crawled up the trees, and the succulent cactus in place of water. The collecting over the days made his head spin: over twenty species of land birds which he was certain had never been identified. Every plant was in flower for it was the flowering season: coarse grasses, cacti, mosses, ferns, salt-loving succulents. When whaleboats went out to chart the other islands, one under Chaffers and Mellersh, and another under Lieutenant Sulivan, the men collected for him: small tortoises, snakes, birds, gulls, buzzards, owls, boobies, warblers, doves, a variety of finches; and all manner of plant life. He instructed them well; they kept the catch of each island in a separate bag.

The *Beagle* ran into trouble only once, from lack of water. The spring they had relied on, near the shore, had been overwashed by waves. Everyone was put on half rations. On Albemarle Charles climbed a crater at the bottom of which appeared a blue and clear circular lake surrounded by bright green succulent plants. He scrambled down its cindery inside, choking with dust, and upon scooping up his first handful found it as salty as brine, even as he had at Port St. Julian when attempting to secure water for an exhausted and dehydrated Captain FitzRoy.

They were saved by an American whaler whose officers kindly gave them three casks of water and a bucket of onions as a present. Captain FitzRoy thanked the Americans, then said to Charles:

"That's not the first time the Americans have shown themselves at least as obliging as, if not more so than, our own countrymen would have been."

"What I admired most, Captain, was the hearty manner in which their liberality was offered."

"I wonder if their prejudices are as strong against the English as ours are against them?"

When Charles first went ashore on Chatham Island, Lieutenant Wickham had asked:

"What does the island feel like?"

"What we might imagine the cultivated parts of the infernal regions to be."

Now he had come full circle; every island he visited was not only gorged with beauteous abundant wild life but, with the exception of the giant tortoises which had been taken away by the thousands by the whaling vessels and pirate ships, all forms of life had proliferated, were intact, untouched by man, exactly as they had evolved over the millions of years since the series of eruptions had created the archipelago. He knew of no other place in the world where nature could be seen as it was on the day of Creation; a laboratory of primordial life, untouched, undefiled, unchanged, having boiled up from the bottom of the ocean millions of years before... and then, slowly, over the aeons been inhabited. But how had each of the islands developed its own, readily differentiated species? More urgently, why?

EDITOR'S NOTE

The use of this excerpt from Irving Stone's just-published biographical novel, *The Origin*, was made possible by Jean Stone, a member of the Board of Directors of the Natural History Museum Alliance. Mrs. Stone is also an Editorial Associate of TERRA.

Irving Stone has published five biographies and eleven biographical novels. His lifetime work has brought six honorary doctorates from leading universities. He was knighted by the government of Italy for his Michelangelo book, *The Agony and the Ecstasy*; he was made an honorary citizen of Athens for *The Greek Treasure*. Mr. Stone's books have been translated into many languages and are inevitably book club selections and best sellers.

On September 15th, the Museum Alliance is sponsoring a Premiere Museum Ball, honoring Irving and Jean Stone. Among the souvenir gifts will be an autographed first edition of *The Origin*, and a poster. There will also be a Darwin exhibit in the Hall of Evolving Life. On Thursday evening, September 18th, Irving and Jean Stone will lecture in the Delacour Auditorium, followed by a wine and cheese reception in the Museum Foyer. There will be two seatings, at 7 p.m. and 8:30 p.m., with reservations limited.

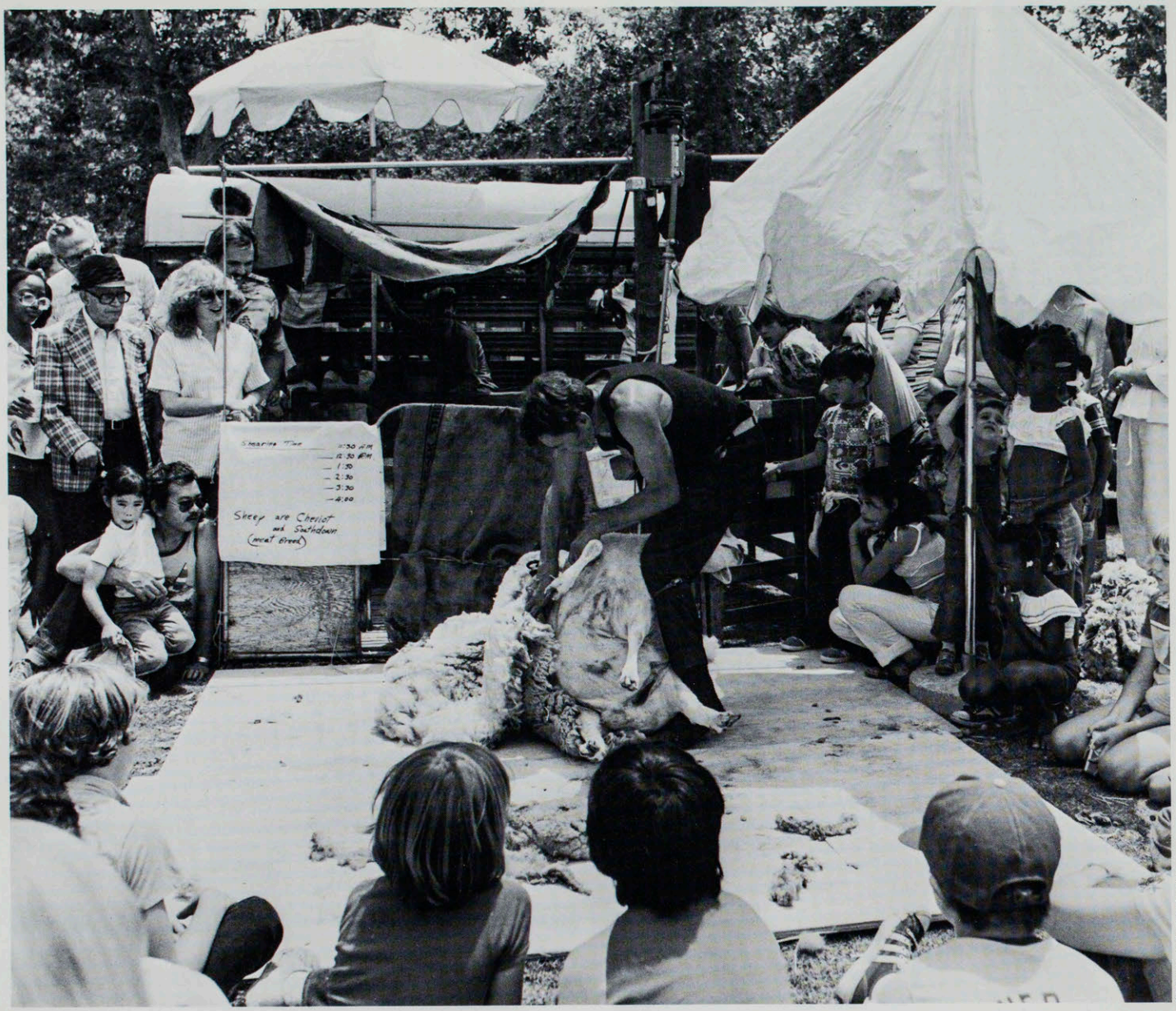


Photo: John DeLeon

(Continued from Page 2) Deputy Director IVPP and Deputy Director of Beijing's Natural History Museum, and Dr. Ju-Kang Woo, Deputy Director IVPP.

Dr. Woo is the foremost Chinese authority on Peking Man, a subspecies of *Homo erectus* dating back more than half a million years. The visit of the Chinese delegation comes at a time of increasing speculation about the mysterious disappearance of the Peking Man bones which were discovered in the 1920's in China and disappeared during World War II. According to various accounts, the fossils were packed in boxes and entrusted to a detachment of U.S. Marines as they prepared to evacuate Beijing. The Marines were captured by Japanese forces and brought back to Beijing as prisoners—but the boxes with the bones of Peking man vanished without a trace. Speculation places the bones at the bottom of the Formosa Strait with the remnants of a Japanese vessel torpedoed by a U.S. submarine. A more local search for the bones was conducted early in the 1970's around Camp Pendleton in North San Diego County.

The visiting Chinese scientists were honored by the Natural History Museum with a banquet at the George C. Page Museum. The banquet was attended by leading paleontologists and anthropologists from local colleges and universities, and the professional and administrative staff of the Natural History Museum. Los Angeles scientists presented their Chinese colleagues with replicas of fossils from local La Brea deposits including the *Smilodon* (saber-tooth cat) and the skull of the La Brea woman.

Craft Heritage Day, 1980

Craft Heritage Day 1980 was a fantastic success. Almost 20,000 people came to watch craftsmen demonstrate crafts belonging to America's history, take special "discovery" tours through the Museum's galleries and talk to costumed docents as they made the large history dioramas come to life. Square dancers and their music entertained on the lawn while a folk and gypsy music concert was offered to a standing room crowd in the auditorium. The aromas and sounds of the antique popcorn wagon brought back memories as members of the history staff popped 1600 bags of popcorn. Special displays of taxidermy and fossil-cleaning attracted large numbers. Nine hundred and sixty balloons were sold by volunteers and forty-six new family memberships to the Museum Alliance were purchased. From the little four-year-old child who asked the demonstrating quilter in the Colonial Hall if she was Mrs. Washington to the gentleman who described his adventures hitching a ride on the old trolley

car a grand time was had by all.

Heritage Day was a joint effort of the Natural History Museum and the Docent Roundtable (museum volunteer group) with a free-day status granted by the Board of Supervisors.

Aquanaut Earle At The Annual Meeting

Dr. Sylvia Earle, well-known marine biologist and famous aquanaut, spoke at the eighteenth annual meeting of the Natural History Museum Alliance. Dr. Earle was recently featured on the ABC television special and in National Geographic magazine. After having served as leader of the first team of women aquanauts in 1970, she subsequently led and participated in oceanographic expeditions in the Atlantic, Pacific, and Indian oceans. In testing a new diving suit, nicknamed "Jim," she made the deepest solo exploration dive of its kind to the ocean floor off the island of Oahu. Currently curator of phycology at the California Academy of Sciences in San Francisco, Dr. Earle continues to be a member of the Museum Alliance and toasted her fellow members with a glass of water. In addition to showing a film of her walk in "Jim," she showed and partially narrated a film in which she was featured, "Exploring Deep Frontiers," a story of the endangered Humpback whales.

French Paleontologist Studies La Brea Horses

The enormous, painstaking task of reorganizing the Rancho La Brea fossil collections at the George C. Page Museum is beginning to bear fruit in many areas. As the word spreads that parts of the research collections are again available for study, visiting scientists and requests for loans of specimens are steadily increasing. So far, the scientist who has come the farthest to study our collections is Dr. Vera Eisenmann of the Institut de Paleontologie, Museum National D'Histoire Naturelle, Paris, France.

Dr. Eisenmann, M.D. and Ph.D., is an authority on the evolution and relationships of Old World Pleistocene and living horses and is now expanding her studies to include New World forms. Her approach is based on the careful analysis of many measurements and requires large collections of well-preserved specimens such as we have from Rancho La Brea. She spent several weeks studying the Page Museum collections and other fossil horse collections at the main Natural History Museum. Her travels in this country, which also included research at the American Museum, the Smithsonian, Yale, U.C. Riverside, and U.C. Berkeley, were partially funded by a grant from the L.S.B. Leakey Foundation.

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